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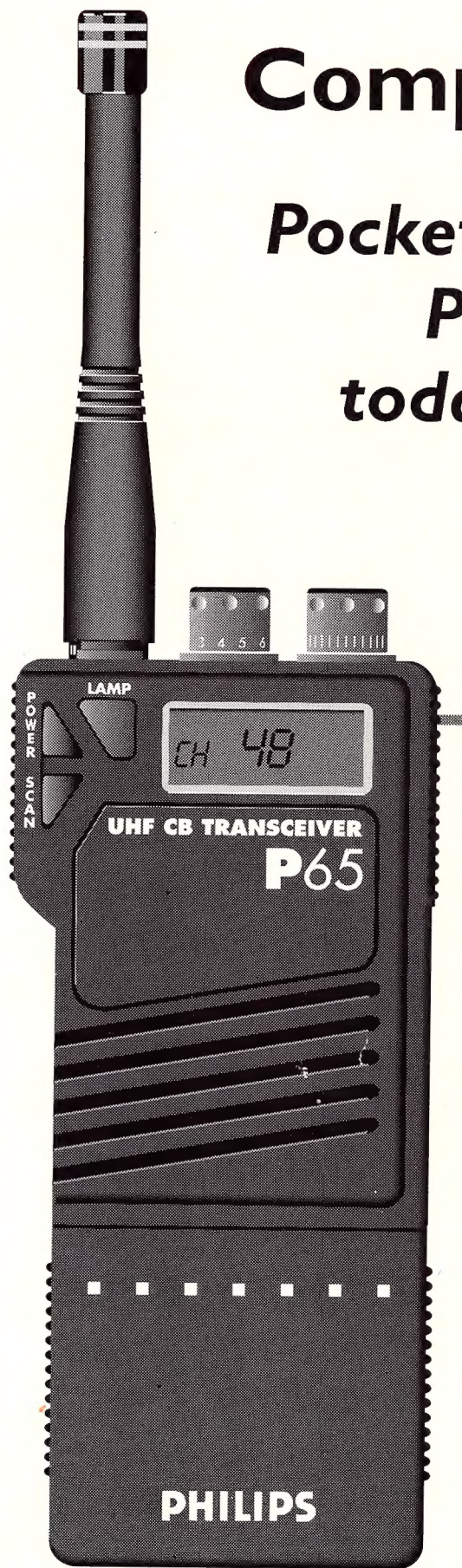
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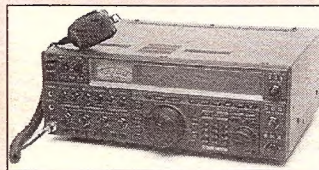
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Editorial Comments...

Welcome to issue one of **Radio and Communications** — with a special welcome to all our old readers from ARA and CBA who have decided to join us in this exciting new venture ...and an even more special welcome again to our ARA/CBA advertisers, many of whom have been with us since the first issue of those magazines back in the early 1970s.

Radio and Communications aims to bring ex-ARA/CBA readers the same hobby-specific editorial they have become used to during the past 20 (well, almost) years and, as we progress, introduce them to the many new and varied aspects of communication in this high-tech era.

Radio valves and CW (Morse Code) were once pretty much the be-all and end-all of communications and they still retain a degree of importance in today's technological age, however the advent of the CBRS service, of computers, modems, satellites, scanning receivers, GPS navigation systems, digital communications, Internet — and all the rest — must now be included in the generic field of "hobby communications".

Many (in fact our 1994 survey indicates as high as 70%) of today's amateurs are yesterday's CBers, while many of today's CBers are tomorrow's amateurs.

The antipathy that existed back in the '70s when 'the bloody Government' gave the 11 metre amateur band to the CBers has largely died — although I have no doubt there remains a core (albeit a fast-dwindling one) of hard-bitten 'oldies' who would still refuse to give the time of day, let alone some advice, to a "bloody CBER".

I doubt they were reading ARA anyway, preferring the more conservative amateur journals...

Happily, most of today's amateurs are somewhat more broadminded in both attitude and interests, own a computer and modem, use Bulletin Boards and possibly Internet, CompuServe, FidoNet or

whatever, perhaps listen to airband and commercial frequencies, decode faxes and download weather satellite images and, in short, share the interests of the hobby communicators who used to read CBA.

The latter, for their part, indicated in our '94 survey that a large percentage intended to become amateurs and were actively studying to that end.

Incidentally, it was Bruce Bathols, VK3UV, who introduced himself to me and a group of CBers on 10m back in 1977 and invited us to his shack to "show us what amateur radio is all about". The result? At least five new amateurs that I know of...

Maybe it's time we *all* started to get back to the basics of communication — and by this I mean introduce ourselves to CBers and maybe even invite them 'into the shack' to 'see what amateur radio is all about' — or are we amateurs all too keen to keep it a closed shop?

Look, there are 'bloody idiots' in both CB and amateur radio — if any proof of this is required try the repeater channels of either service! However, I sometimes wonder if this fringe minority can read anyway, so they'd probably have little interest in a magazine such as this.

What we have attempted to do with this new publication is to continue to bring the same news, reviews, features and information to both ARA and CBA readers as they previously received in the two magazines — all we have done is to combine it all into one title.

If you're an amateur who just isn't interested in a review of the latest UHF CB radio, that's fine — don't read it, as there's still going to be reviews on your own amateur equipment. Likewise, if you're an ex-CBA reader who couldn't care less whether six metres is open or not, ignore it and read the UHF CB review or DX report.

Ex-readers of both will find a shared interest in many of the articles and reviews

as they appear over the months, while many will discover areas of communication they did not even know existed.

Readers of our last issue of ARA will have read that there is a strong, and to date successful, attempt being made by the New Zealand based ORACLE group to have CW removed as an essential part of the amateur licencing arrangement.

It is very early days yet, but, the fact remains that the first real shot has been fired, and maybe — just maybe — the time is right to *seriously* look at this long contentious issue.

I doubt that anyone can advance the argument that CW is not a Dinosaur although I have no doubt many will try.

I am not advocating that it should simply be dropped to make licencing easier — but why not replace its exam with demonstrated higher technical, and preferably practical 'hands-on' technical proficiency.

The fact that 'no-code' licence holders would probably not have overseas reciprocal rights is something I think they can probably live with.

We are excluding hundreds, probably *thousands*, of potential amateurs by requiring them to pass a test which has no practical place in today's world — sorry about that, but it's a fact. The new Novice Limited licence class shows the SMA agrees...

If we are all serious about both improving and increasing the breed we need to face reality. We need to bring our licencing requirements into the modern world and open up membership of our hobby to the new breed of young electronic enthusiasts, many of whom can home-build a computer — but don't see the relevance of CW as a licence requirement.

Enjoy this first issue of Radio and Communications — it will get still bigger and better as we fine-tune it to suit your requirements...and thanks for joining us.

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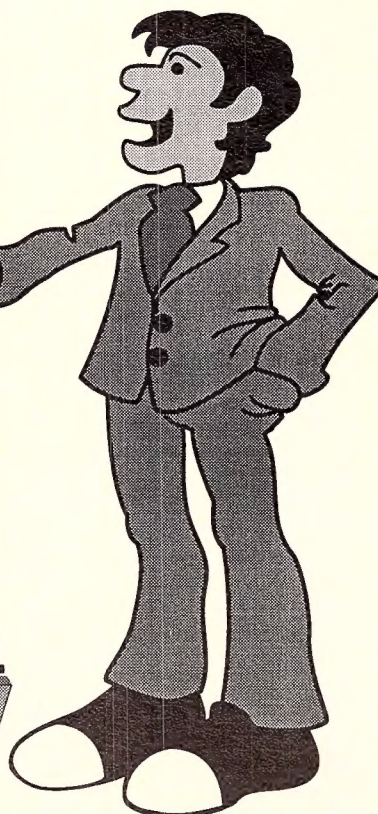
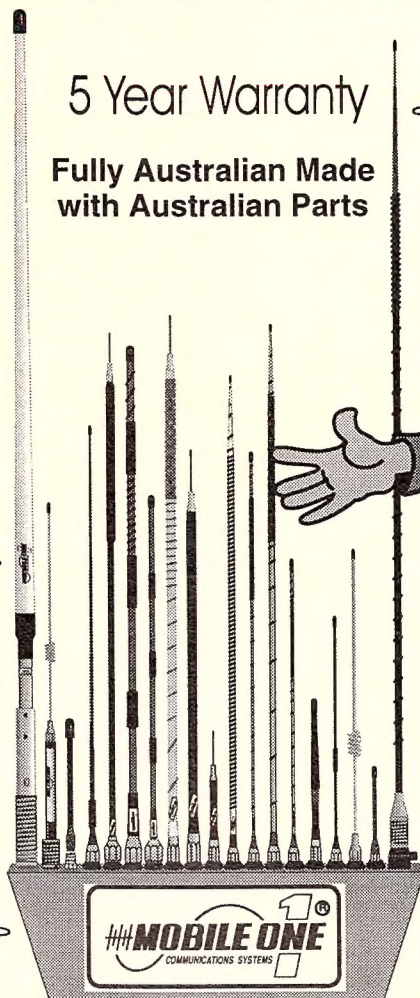
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Icom IC-775DSP

the new base station champion uses DSP to great advantage

By Neil Duncan, VK3ND

We blathered on at great length when Icom took its successful IC-761 and transformed it into the capable IC-765. This second-from-top rig started out at about \$5000 — and that was quite a bit more than five years ago!

Reading the specification sheets utterly failed to tell you how much better than a 'normal' HF rig the IC-765 was... but now we've had to dig deep — very deep — into the superlatives bin to describe its replacement, for the IC-775DSP is so much better than the radio it replaces that it's not at all funny.

We asked the very proud owner of an Icom IC-765 to cast a wary eye over the newcomer, and tell us if the wait was worth while...

As the battle for the title of 'best HF rig on the market' rages on we, the members of the amateur radio public, reap the benefit. Despite the excellence of so much of the existing range of gear, magnificent new models just keep appearing. The latest trends at the top end of the market include rigs with twin receivers, more and more transmit power, DSP options and a whole bag of clever facilities. Icom is never one to be left out of this push, as the introduction of the magnificent new Icom IC-775DSP so decidedly indicates.

In this instance, Icom's basic philosophy seems to have been to take an IC-765 (for several years Icom's penultimate HF rig), commission a complete re-design from the ground up, add 25 more knobs and buttons, implement a second receiver à la IC-781, re-shape the finals into a set of high voltage MOSFET devices, add glorious twin passband tuning to the receiver, add a DSP chipset to generate SSB and CW and to make the receiver crystal clear, add an automatic notch filter, triple band-stacking, make the display huge... and you have only started on the way. Vast ranges of sparkling new ideas have been moulded into the IC-775DSP.

So why would you spend around \$7000 for this sparkling new set? Why not simply settle for a low- or medium-priced rig — after all, it gets you from A to B, doesn't it? Let's see just how good the IC-775DSP is and find just how this high-end rig stacks up against its competitors...

Setting up

An identical problem to the one you meet with other top-end rigs confronts your first introduction to the IC-775DSP. Lugging the thing from the car to the shack is a cruel and inhumane fitness exercise — even hauling it out of the box is virtually a block and tackle job! Actually, on closer inspection, the IC-775DSP falls short of the size and weight of the dear old IC-765. On the bench, however, your whole perception of what is going on changes as the full impact of this magnificent rig emerges.

Plugging in the power cable is easy enough, and the only other things you need to connect are the antenna, the earth (they work better that way!) and a microphone. I borrowed an SM-8 desk microphone from Daycom for the review of this rig as I thought Icom's standard hand mic could sell the rig's capabilities short. The only other little problem I had was working out which connector to plug the antenna into. You see, there are two antenna sockets on the back panel, which might come as a surprise to some. I guess their presence explains why there is a pair of front panel switches for antenna selection. Beauty — I'll use one for the HF beam and the other for the G5RV!

Once you succeed in finding the power switch amongst the 92 buttons and things, you are well on the way. You push it and wait; 'click click', observe the light show and then sit back and wait for the arrival of the ginormous front panel LCD digits to arrive on the scene. Now I could be wrong



but aren't they the biggest display digits on any rig? At almost 2cm tall, and occupying the area of a football field, the frequency display will delight the more mature amateur with, errr, some visual constraints. Okay, okay I admit it — this aspect is *wonderful*!

So did I have any trouble from that point on? Naah, there is an intuitive feel about operating the IC-775DSP (particularly if you know the IC-765 intimately!), and with the basic functions being so easily mastered I was on the air in no time. For a more thorough 'play', though, you will need the manual and the manual for the IC-775DSP is an absolute gem. Every possible aspect of operation is covered in the usual pristine Icom manner. My suggestion for you is to find a nice Sunday afternoon to plonk yourself outside in the hammock for a good read. While most of the basic functions of the radio are easily found, many others hide behind extended button presses or the use of menu-driven selections.

What's new?

To extol the full virtues of the IC-775DSP would take up many more pages than have been allocated for this review. I will therefore, summarise the new and special features of the IC-775DSP and then proceed to an overall evaluation of the set. As I see it, its key attributes are:

- **DSP chipset.** The quality of this exciting newcomer is enhanced dramatically by the inclusion of DSP facilities. For a start, you get phasing-method SSB generation all done within the digital chips. For those who, like me, recall the early days of SSB where 'the phasing method' of SSB generation was so popular, the association of this method and hi-fi audio will be quite familiar. The IC-775DSP is available overseas without the DSP option (it is then called an IC-775) but after seeing the difference on both receive and transmit between 'DSP in' and 'DSP out' you can see why Icom Australia has chosen to import only the DSP version.

- **200 watts of power.** On the bench, 30 minutes at the full rated output hardly fussed the set. Do you still need to purchase a linear amplifier if you have an IC-775DSP? The high voltage and high-powered MOSFETS really generate a whale of a clean signal, believe me!

- **Two receivers.** I suppose I should rave on about having a second receiver, but I find myself not really wanting one. To me, it is like having a very wide range RIT control, but one which results in the arrival of two signals in the shack at the one time. The second receiver in the IC-

775DSP is well implemented, but it does have some limitations. First, the two receivers share the same IF strip. That means you're stuck with the same mode, bandwidth selection and so on for both receivers. Secondly, you really have to stay within the same band or, more precisely, within the same front-end band chunk. 7 MHz and 10 MHz go quite well together, for example. If you don't do this, the sensitivity of the second receiver plummets.

- **Antenna selection.** You can select antennas from the front panel or even organise the things to swap around automatically when you change bands.

- **CW facilities.** Here you are offered a CW keyer as standard, three memories (with repeat if you want it) for CQ calls and other CW delights, a super-narrow filter, CW reverse (or 'other sideband'), an audio peak filter and full QSK options. A big thank you from a CW buff, Icom. These facilities are second to none.

- **Dial resolution** down to 1 Hz with a slow tuning speed of 500 Hz per turn. With the simple front-panel selection for this pair being available, users of digital modes should start drooling.

- **Triple band-stacking registers** (try pressing one of the band buttons three times), twin VFOs and 100 memories.

- **Lightning fast automatic antenna tuner** with manual control if needed.

- A variable control for **AGC speed**. I was surprised how useful this becomes.

- Two **receiver pre-amps** are provided. The one for 21 MHz and above is of a higher gain than the other. Remember there is a trade-off between sensitivity and cross-modulation in receiver pre-amps.

- You can fully tailor the **transmit audio**. That is, top and lower cut frequencies are user-selectable.

- Twin **passband tuning**. For me, this is the most important difference between this rig and the IC-765. It is the equivalent to having a variable bandwidth control.

- Up to ten **'quick memories'** are provided.

- A DSP **'noise reduction'** system can be switched in for hissy or otherwise noisy signals. Yes, it works spectacularly well.

- As well as the IF notch filter, an automatic fixed-tone zapper is built in. Is there one or more heterodyne tones bothering you? Press the button and magically, they are gone. On CW, it becomes an automatic peaking filter. Remarkable!

On air

Once you finally you get on the air for a bit of a yak, you simply tire of the rave

and impromptu audio quality reports the IC-775DSP invokes. People queue up to tell you how clear the signal is.

In my view, the very best sounding SSB signals have come from the HT-37 (a 1970s valve phasing rig), Icom's own IC-781, the Yaesu FT-1000 and the top Kenwood DSP rig, the lush TS-950SDX. I find it hard to distinguish between any members of this set in this regard and now include the IC-775DSP in that elite club.

The extra power is most certainly useful and results in DX actually *hearing* you. I found the CW facilities sheer magic, and especially when you sum this up along with that super resolution and dial speed. I hereby pronounce the Icom IC-775DSP the best amateur transceiver on the market for CW.

The receiver in the IC-775DSP is absolutely excellent. The receive audio is amazingly clear, with the DSP chip set being primarily responsible for that fact. While the main tuning knob is not quite as good as that of its predecessor (the IC-765), it is not far short of the mark. I suspect these two would share the prize for the sets with the biggest knobs...

Overall, there is a silky smoothness involved in using the IC-775DSP. If you are faint-hearted about the complexity of

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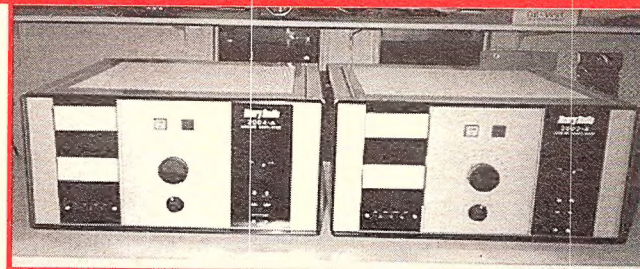
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the top-end rigs, this one won't help. It brings just about everything — except the kitchen sink is provided for you. You find yourself in command of every possible HF facility and option. Yes, there are simpler rigs on the market...

Any criticisms? Well yes. The VOX on/off button is way down low amongst the little-used ones at the lower left of the front panel. If the TV is too loud or if the kids are bawling, the VOX usually has to come off in a hurry. The trouble is that you end up pushing all 92 knobs and so on looking for the appropriate button.

Secondly, I found that FM repeater operation and the memorising of frequencies for them to be a little messy. That is all I could find wrong though!

Oh, maybe that manual audio peak filter is a little broad or something. I guess some people still want it despite the other things you can get up to in its place these days.

There are some options you can buy. A high-stability crystal oscillator, up to five more IF filters (the supplied ones have outstanding shape factors so maybe they will do) but with the full complement, you can select all kinds of cascaded combinations. A voice synthesiser, computer interface and even rack handles are available.

Summary

This is a truly outstanding HF radio. The quality of the audio in both directions just delights and amazes me. This is clearly the most outstanding aspect of the IC-775DSP.

The stability, cleanliness, frequency resolution and accuracy of the frequency-determining systems are also quite exemplary. I found that twin passband tuning system to represent a major advancement over the IC-765 too, but it doesn't stop there.

The extra power, better CW facilities, stunningly sensitive and robust receiver and generous and heavy duty overall proportions to be sheer delights too.

I will be interested to hear the response of other people to the IC-775DSP, since I simply find myself overwhelmed at the sheer quality of it. Clearly any advertisements for the IC-775DSP should have classical music playing in the background and should use images more normally associated with Rolls-Royce or Mercedes car advertisements.

R&C thanks Daycom Communications for the loan of the review transceiver.

Specifications

General

Frequency coverage:	100 kHz to 29.990 MHz (receive). All bands 160 to 10 metres (tx).
Modes:	LSB, USB, CW, RTTY, AM and FM.
Frequency stability:	±1 PPM per degree C at 29 MHz
Antenna impedance:	50 ohms
Memories:	101, with two for scan-edge (but none for repeater use).
Frequency stability	Less than ±200Hz drift first hour.
Supply voltage:	240 VAC
Current consumption:	RX 150 VA, 760 VA or less.
Size:	424 x 150 x 390 mm (WHD)
Weight:	16.5 kg

Transmitter

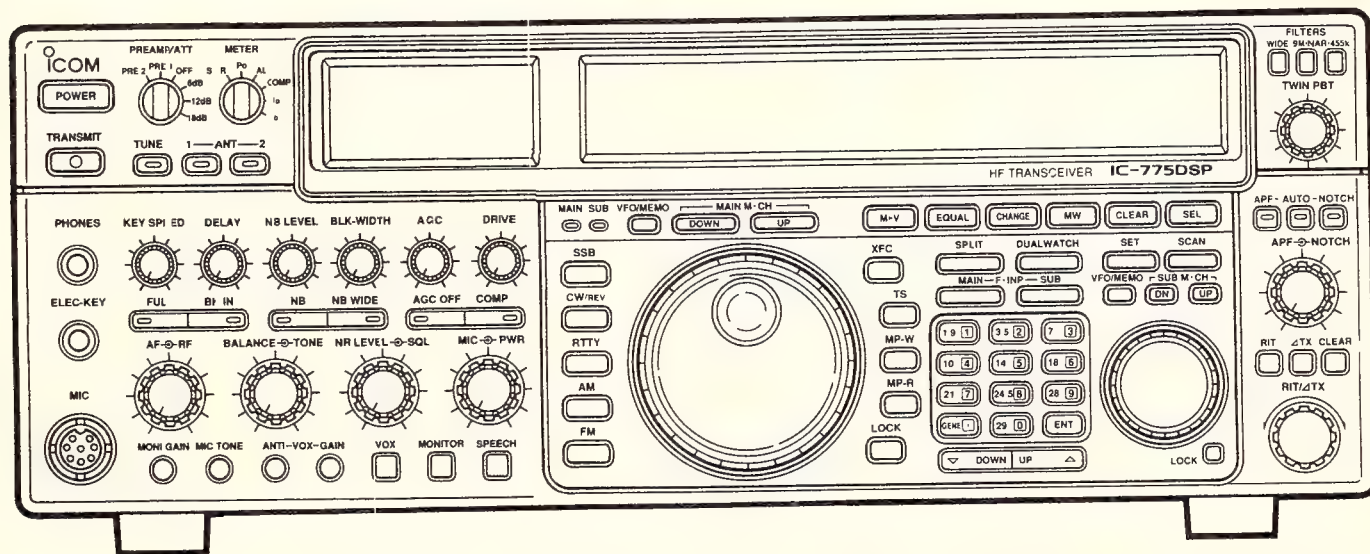
Output power:	5 to 200 watts except AM 5 to 50 watts on AM
SSB carrier suppression:	>40 dB
Spurious radiation:	<-60 dB
Unwanted sideband:	More than 55 dB down

Receiver

Circuit type:	Quadruple conversion except FM. Triple conversion on FM.
Intermediate Frequencies:	69, 9, 0.455 and 10 MHz.
Sensitivity:	0.16µV CW, SSB, for 10dB SINAD 2.00µV AM 0.50µV FM for 12dB SINAD
Selectivity (-6/-60 dB):	2.4/4.0 kHz SSB/CW, max BW
Selectivity (-6/-60 dB):	6.0/20.0 kHz AM, max bandwidth
Selectivity (-6/-30 dB):	15/30 kHz FM, max bandwidth
Spurious and image rejection:	more than 95 dB
RIT:	±9.99 kHz
AF output:	2.6W into 4Ω @ less than 2% THD.

Automatic antenna tuner

Matching range:	16.7 to 150Ω impedance
Minimum operating power:	8 watts
SWR range:	3:1 or less.



Emtron switch-mode power supply

A new switch-mode power supply from Emtronics

By Ken Reynolds

The new 13.8VDC EPS-20s Switch Mode Power Supply (SMPS) from Emtronics is a lightweight, compact, medium-duty power source of eight amps continuous current suitable for a variety of applications around the shack.

The EPS-20s switch-mode bench-mounted power supply is rated at 20 amps peak and 15 amps for a one minute on, one minute off (50 per cent) duty cycle, making it ideal to drive a range of medium-power (around 100 watts output) side-band transceivers because of their intermittent high value current requirements. The EPS-20s also performs well for constant power applications of around 100 watts.

We found it ideal for operating a variety of medium-power VHF and UHF power amplifiers.

Switch mode, you say?

Switch-mode power supplies have been around for quite some years now, during which time they have earned a rather doubtful reputation for production of RF noise and, in some instances, unreliability.

In fact, when the discussion topic turns to switched-mode power supplies the participants usually bail-out in droves amid mutterings like "...noisy bastards..." and "...They could kill ya', those things...".

It was found that the most common problem with switched-mode power supplies was not so much the supplies as the users themselves. A general lack of knowledge about their operation, coupled to suspicion about the light weight of such appliances capable of producing supply currents of 20 amperes or more at 13.8 volts for such a handsome power to weight ratio were the real problems.

In the case of the Emtron supply, we get a substantial 100 watts continuous from a total weight of just two kilograms. After all, everybody knows there is no substitute for the massive weight of an iron core when it comes to cranking out the ol' volt-amps hours!

The old-style laminated transformers with their warm, friendly humming and stray magnetic fields insidiously erasing your

video tapes and floppy data media sure are pretty hard to beat... especially when the search is for elementary, effective circuitry.

As for simple... Well, that is one thing a switch mode power supply is *not* and this is one of the reasons they are held in suspicion by many operators. In fairness, though, they earned their early history of unreliability before the refinements of the last decade or so.

A good example of modern, successful switched-mode power supplies are those that reliably power the millions of PCs around the world. However, the process of evolution has discarded the inferior properties and glitches to make modern switched-mode power supplies reliable, safe and economical with minimum undesired RF emissions.

The EPS-20s offers a range of desirable features that include automatic switching between its high and low ranges of AC operating voltages — 90 to 125 VAC and 200 to 270VAC at line frequencies between 50 and 60Hz.

Nominal output voltage is 13.8 volts dc with a line voltage regulation of $\pm 50\text{mV}$ for 15 amps drain, and ripple voltage is less than 25mV for the same load. Load regulation is quite good with a maximum variation of up to 0.25 volts at the nominated voltage.

The supply is loaded with non-destructive protection circuitry having output over-voltage protection set at 15 volts while the peak current threshold is 22 amps. While output short circuit protection is also included, we have some minor misgivings about its ability to detect a short circuit and then shut down the supply before damaging, sustaining damage hits a load.

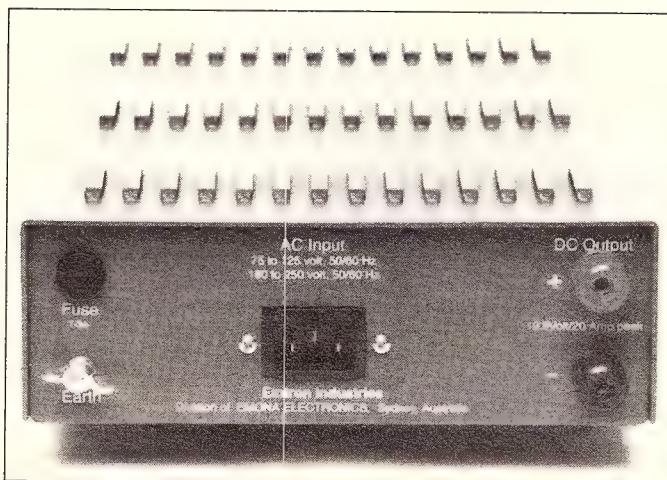
There is no question here that the SMPS adequately protects itself — its main goal. However, it is still nice to know that some 'ham'-fisted operators (pardon the pun) might save themselves a little grief by not silencing a new rig through polarity carelessness. Hands up those who have never got the wires reversed... at least once.

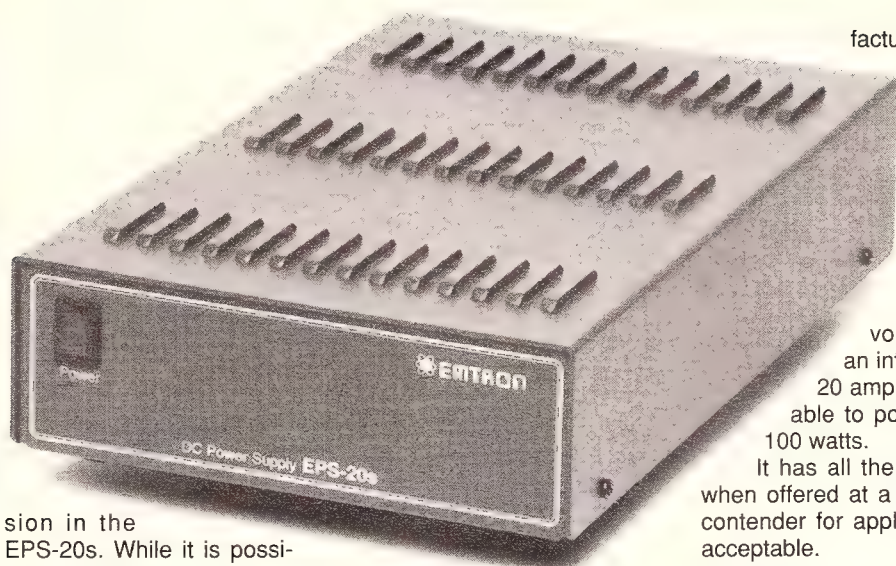
Our power supply short circuit test here is simple but effective. We short circuit the operating power supply's output with a power diode in its conducting direction; the type normally used for reverse polarity protection in many light- to medium-duty rigs.

For ultimate realism we use an unfused DC power cable one metre long and rated at 25 amps capacity. So, if the power supply shuts down leaving the diode intact one might rate the short circuit protection as excellent — favoring the safety of the load, of course. If the diode is damaged to any degree, ranging from just ordinary open circuit through 'cracked' and up to vaporised, it is fair to rate the power supply short circuit protection accordingly.

With the EPS-20s results of the test were a mixed bag. Six out of 10 tests saw the diode's integrity preserved, while in the other four samples the diodes were fragmented. Ten new EM-404 diodes were used in the tests.

Considerable attention has been given to RF noise suppres-





sion in the EPS-20s. While it is possible to detect a wide band of RF output (rubbish) signals throughout the HF spectrum we found that the level was well below the ambient background random noise to the point that it was undetectable under normal, sensible operating conditions. That is, if one is silly enough to use the EPS-20s as a site to mount a magnetic base antenna you deserve what you get...!

The power supply is Australian made and meets the design standards for AS3260, ULA and CSA.

Basic theory of operation

Conventional linear power supplies are only about 30 per cent efficient. Compare this figure to switched-mode supplies which hover around the 70 per cent mark. This is a major reason for the great difference in power to weight and power to size ratios between the two power supply styles.

While the linear supply uses an elementary regulator and filtering circuit (usually) to maintain a constant output voltage, the SMPS takes a more radical approach.

The SMPS electronically switches on and off a higher voltage at frequencies generally between 50kHz and 100kHz, and then filters the resultant rectangular output transients through a sophisticated low-pass filter to produce the required DC output voltage.

A feedback loop — not unlike a PLL in principle — detects the DC output condition, comparing it to a voltage reference, and adjusts the switching ratio to achieve the desired state of equilibrium according to the changing load conditions. It is the high frequency switching which can produce abundant RF hash, and this often renders SMPDs unsuitable for communications work. However, the EPS-20s is so well filtered it does not suffer from this problem.

Mechanicals

The EPS-20s weighs in at only two kilograms, and measures a modest 320mm deep by 185mm wide and only 70mm high. It is a 'hide-away' bench supply with a single off/on rocker switch for power on the front panel. No metering facility is provided. Output connection is through standard terminal posts mounted on the rear panel.

The case is nicely constructed from steel panels with ventilation louvres which also add strength to the otherwise flat case top.

Internally the EPS-20s is impressively designed and manu-

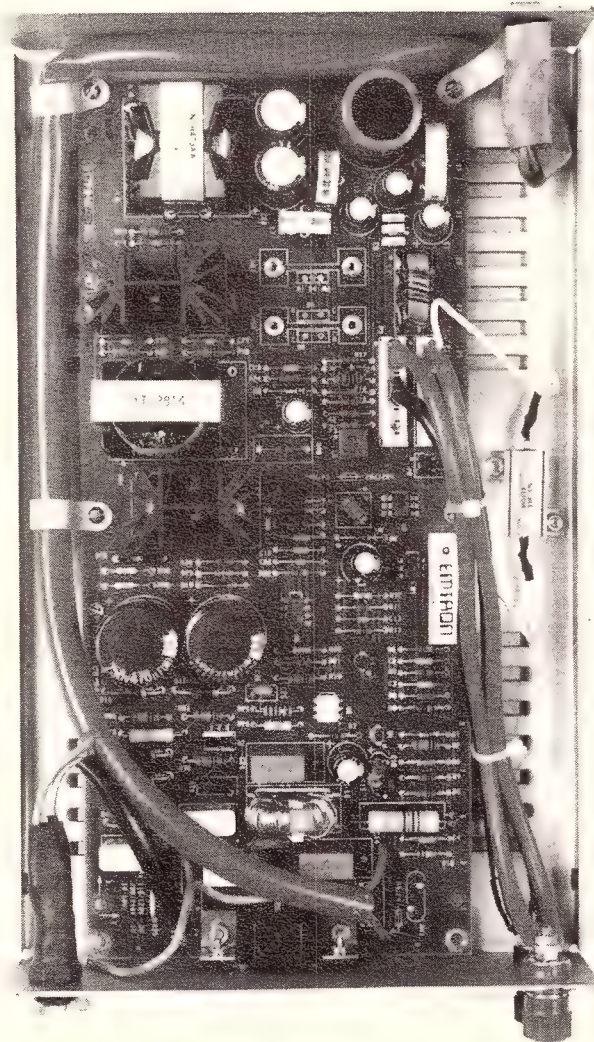
factured, with the style and neatness we are coming to expect from CAD products. All componentry is conventional pigtail-style with very neat board insertions, and — almost needless to say about Emtron products — you would have trouble getting your hands on better grade components.

Summary

The EPS-20s is a compact, light-weight switch-mode power supply delivering 13.8 volts DC at a continuous eight amps, allowing an intermittent drain of 15 amps with headroom for 20 amp peaks. RF hash output is low, making it suitable to power mid-range HF transceivers up to about 100 watts.

It has all the desirable overload protection circuitry and, when offered at a RRP of \$299, the EPS-20s has to be a top contender for applications where alternate power supplies are acceptable.

RADIO and COMMUNICATIONS thanks **Emtronics** for the loan of the review unit.



EQUIPMENT EVALUATION

Among all the other 'welcomes' you'll be reading at the start of all these great new columns in this great new magazine, let me add mine.

It's a very *special* welcome, because this isn't exactly a radio column as such. **Baudwalking** is all about communications, yes, but not the 'wireless' variety which peppers these pages. We all felt so clever when the likes of Messrs Hertz, Maxwell and Marconi pioneered the art of sending messages via radio waves in the latter part of the 19th Century and did away with the need for vast networks of cables.

Yet here we are, barely a hundred years later, and jumping into a whole new form of communications, one which in many ways is just as revolutionary as wireless, and it couldn't live without all those cables which our grandparents thought we'd one day be able to do without. The world is once again getting wired. Businesses are getting connected. Homes and schools are getting hooked up.

The reason? The more populist and less accurate media call it the 'information superhighway' (although in my mind it's more of a super 'hypeway' for now!). Today this is most evident as the Internet. In the months and years ahead it will grow to encompass interactive services of enormous scope and potential.

This is a new form of communications, and *that* is what **Baudwalking** is all about. It's the global web of online services with which you, through your home computer, can connect to the rest of the world.

In this first issue of **R&C** **Baudwalking** will introduce you to the Internet. You'll learn what it is, how it works, how to get connected and what you can do once you're online.

Because this is a radio magazine, and we're all keen radio buffs, next month we'll add radio to the mix. You'll learn how to use the various Internet tools to access some great places with loads of information for amateurs, scanner fans, shortwave listeners and much more. We'll also cover other online services such as CompuServe and new offerings like the Microsoft Network.

What are 'online services'?

What do I mean when I talk about 'online services'? It's a phrase which describes any type of computer to which you can connect over the telephone system, by simply plugging your PC into the phone line. You'll also need a special black box called a 'modem' and a special type of computer program known as 'communications software'.

Baudwalking

Baudwalking

The telephone system was designed for human voices, not the digital chatter of a computer, so you need the modem to convert the digital stuff to something the phone line can handle. The computer at the other end of the phone line — the computer you'll be connected to, the one which is behind the online service — also has a modem to convert this stuff back to PC-talk.

And just as word processing software lets your PC crunch words like a super typewriter, so communications software lets the two computers talk to one another.

Although you only need one modem to connect to any online service, you'll possibly need a variety of comms software programs, sometimes one (or even more) for each online service depending on how complex the service is.

You can generally group online services into three very broad categories:

The first group takes in the 'bulletin board systems'. A BBS is an online service often run by an enthusiast for fun, although some can be rather profitable if they're well run and have a lot to offer the user.

They just buy a conventional PC, load up some special 'BBS software', hook up the modem and you can dial in. BBSs are great places to start getting online, and they're wonderfully covered in Patrick McDonald's *Online* column here in **R&C**.

Then come commercial services. These are run on very sophisticated computers and are run solely for profit. Some provide general public access so that anyone can dial in and use them for a set fee.

CompuServe, Apple eWorld and the forthcoming Microsoft Network are a few examples.

Other commercial services have a special focus and are designed to provide information for doctors and lawyers. You can also get private systems restricted to the employees of a company or the contributors to a newspaper or magazine (we have one such closed system here in **R&C**; it's how

the various stories are sent from contributors across Australia to the editor in Melbourne).

The third type of online service is very specific indeed — it's the Internet, and it's nothing like any other type of online service.

The Internet

The Internet is a vast, sprawling mass of computers, quite literally millions of them, ranging from desktop PCs to large university and corporate 'mainframes' which look like something bought from an ASIO garage sale. They're all interconnected, like the strands of a spider's web, so that any one computer can somehow connect to another.

This connection may be quite direct, or — and this is more often the case — it will detour through hundreds of other computers. That's how the Internet came into existence. It was designed as a research experiment during the Cold War of the late 1960s, as the government tried to develop a communications network which could survive the massive disruption of a nuclear attack.

A conventional computer network is built something like a chain — remove one link and the chain is broken, the network useless.

But this 'interconnected network' (which, I'm told, is how it got the name of Internet) is more like a fence made from chicken wire, to use a very common example. Remove one link and it's still connected, still strong. Imagine computers dotted all over the USA, and later the world, connected in this chicken wire fashion. Even if a nuclear

bomb from the former USSR hit some key US city (which is what the Americans were afraid of) the computers across the rest of the continent would still be connected and could still function.

This super network was so good that researchers started using it as a part of their everyday work. They could communicate with comrades across the US to share information, data and notes. Then universities joined in. Slowly the Internet went from being a government tool to a public tool, a scientific network to an academic one.

Then individuals started getting connected, first by hooking into university PCs and then via special companies set up to provide Internet access (these are called 'Internet service providers', or ISPs). And 'the Net' boomed to the point where estimates of the number of users range from a very conservative five million to an amazing 20 million.

Now, you've gotta wonder what the Internet has to offer that could make it so darned popular...

What can you do on the Net?

It's probably easier to cover what you *can't* do on the Net, but let's walk the hard path.

You can download software and information on just about any topic of interest. You can communicate with anyone else using the Internet (and even commercial systems and bulletin boards connected to the Net via a 'gateway') — using private electronic mail or 'e-mail', plus join public discussion groups where everyone can read everyone else's messages and add their own replies. You can also have live as-it-happens discussions with people sitting in front of their PC on the other side of the world.

And, of course, you can sift through *huge* amounts of information. On a system as vast and uncontrolled as the Net it's very likely you may know *what* you want but not exactly where you can locate it. You can even access and operate other computers just as if they were your own. When you first start getting into the Internet or even talking to someone about getting into it, you'll hear a whole stack of terms which are likely to be quite confusing at first. The most common relate to the various 'tools' of the Internet, which let you do the things we've just talked about.

The tools are built into the fabric of the Internet, and once you're connected to the Internet all you need do is have the right piece of software and that tool is at your fingertips.

E-mail

This is one of the simplest things you can do with the Net, and it's great. Imagine having instant (well, *near*-instant) written communications with a friend, a relative or someone in a company you want to deal with. Just type your message, hit the Send button and it's away, travelling across the Internet to its destination.

The key to e-mail, just like hand-delivered Australia Post-type snail mail, is the address. When you join the Internet you get an Internet e-mail address which tells other people, and their computers, how they can reach you.

A typical Internet e-mail address will be something like fredsmith@eureka.edu.au. This address looks a little strange at first.

What's it all mean? 'Fredsmith' is the name of the person. It could just as easily be 'fsmith' or 'freds' or just plain 'fred', whatever he or she chooses. The @ symbol is a standard Internet addressing convention which tells you that Fred Smith can be reached *at* a particular location. In this invented example, that location is called 'eureka' — it's the special name of a computer connected to the Internet.

But just what *is* 'eureka'? The 'edu' following tells us that eureka is some kind of educational body — that's another standard Internet code. There's edu for education, com for commercial, gov for government, mil for military and org for other types of organisations. So from this you can see that 'eureka' might, for instance, be a fictional university called Eureka University.

The last bit of the address tells you that our Eureka system is located in Australia. There are other country codes such as 'fr' for France and 'uk' for the United Kingdom. Because the Internet started in the USA there's no US code as such — so if you saw an e-mail address without a country code (such as chuck@yankee.com) then it'd be an American one.

Note that each element of the address is separated by a full stop. This is pronounced as 'dot', and the '@' symbol as 'at'. So if you asked Fred for his e-mail address he'd say 'fredsmith-at-eureka-dot-edu-dot-au' (and he'd pronounce the 'au' as letters, not a word).

The World Wide Web

This is the newest and most amazing part of the Internet. It's a special subset of the Net, consisting of millions of computers which can display

wonderfully colorful 'pages' on your computer screen. These work just like Windows computer software on a PC, or in the native environment of an Amiga or Apple Macintosh. There are icons and words which you can 'click' on with a mouse and they'll call up another page or some information on screen.

With the Web you can be connected to a computer in your home town and suddenly, with the click of a button, you get a connection through to another machine in a London museum, or a French university, or a Canadian company. And the pictures... Web pages support glorious colorful pictures.

This great-looking interface and the point-and-click ease of use has made the World Wide Web the hottest and most exciting part of personal computing.

Newsgroups

Here's where you swap comments and notes and tips and questions and answers and jokes and sarcasm with people who share your interest in just about *anything*. These discussion groups cover... well, you name it.

We're concerned with radio here in R&C, so rest assured there are newsgroups for talking about shortwave radio, scanning, amateur radio, satellite TV and much, *much* more. Add to this newsgroups which cover your tastes in music, business, other hobbies and concerns, and you can see that the Internet really is a new way of communicating, just like amateur radio or CB radio.

IRC

This stands for 'Internet Relay Chat' and is how you can 'talk' (well, 'type' to be more accurate) live to anyone else on the Net.

Again, there are chat 'channels' for any topic you care to mention, and you can even create your own chat channel on the fly. It's a real buzz to sit in front of your PC typing away to some fellow soul who could as easily be in the next room as in Alaska.

FTP

'File Transfer Protocol' is the tool you use to fetch computer files from other computers. These files can be new software programs, games, documents, digitised pictures and lots more. Just find the file you want and it can be transferred to your own PC.

Gopher

This has been likened to an automatic Internet 'librarian' — a Gopher

program lets you search for and work your way through information in a structured menu-like manner. It's all well and good to have a wealth of information floating around on heaps of PCs, but what good is this if you can't find what you need? Gopher links these together.

Telnet

Imagine logging into one of NASA's own computers! You can't exactly launch a Space Shuttle, but you can do some amazing things by operating a NASA machine from your own home PC. That's what Telnet does — it puts you in the driver's seat so you can run programs and call data which resides on any Telnet PC just as if it was on your own hard drive.

Telnet is fairly cumbersome and not the most interesting of Internet tools for most people, but in the hands of an experienced user it's proof positive of the fantastic things you can do on the Net.

How do I get connected?

Well, you already know that you need some sort of personal computer, and it's not within the scope of this article to go into great depth on what to look for or what all the jargon means. Computer magazines such as *Australian PC User* are best suited to this. Suffice to say that, in this article, the generic term 'PC' doesn't limit you to an IBM-compatible personal computer. You could be using an Apple Macintosh, an Amiga or one of several other kinds of computer.

You will need a modem — and a fast one. Modem speed is measured in 'bits per second' (bps) or 'kilobits per second' (kbps), and if you really want to get into the Net (especially the World Wide Web) you should settle for nothing less than a 28.8kbps modem, although a 14.4kbps unit will make do at a pinch if you already have one of these. A good 28.8kbps unit will cost you around \$450 to \$600, although prices continue to fall.

Then you have to sign up with an Internet service provider or ISP. These give you an Internet e-mail address (remember, if the ISP was a commercial company called Net Plus your address might be jimjones@netplus.com.au), and in this case you would use your modem to dial into the Net Plus system to connect live onto the Internet.

There are some companies which have dial-in 'nodes' in most capital cities and even some regional areas — some of these, alphabetically, are AUSNet (02 241 5888), DIAix (1800 642 433), Interconnect (1800 818 262), Microplex (02 438 1234), Labtam Access One (03 587 1444) and OzEmail (1800 805 874). There are many more ISPs which just service one local area — check with local PC users and the computer section of your daily newspaper (those of the Sydney Morning Herald, The Age and many others appear every Tuesday) for advertisements.

News and radio-related info from the Internet

IPS Plugs Into Internet

IPS Radio and Space Services

here in Sydney has joined the Internet in a big way. As previously mentioned to readers of dear old CB Action, the IPS has a World Wide Web Home page at <http://www.ips.gov.au/rwc/>. And now the IPS has set up a series of electronic mailing lists which anyone can join to receive up-to-date solar and geophysical data.

Depending on what data you want and how regularly you want it, it can be delivered monthly, weekly or even daily right to your electronic doorstep, and it's all for free. There are six mailing lists available: Daily solar & geophysical report (dsgr); Daily HF propagation report (dhfpr); Weekly solar & geophysical report (wsgr); Weekly HF propagation report (whfpr); Weekly geophysical report (wgr); and Monthly solar & geophysical report (msgr).

The address to subscribe to these mailing groups is as follows:

Send a mail message to majordomo@ips.gov.au and in the body of the message put the following: Subscribe rwc-dsgr; Subscribe rwc-dhfpr; Subscribe rwc-msgr; Subscribe rwc-wsgr; Subscribe rwc-whfpr; or Subscribe rwc-wgr.

The software at the IPS end will send back an acknowledgment together with details of the mailing list you have subscribed to. You can also join these groups via their World Wide

Web home page. They also have an FTP site at <ftp://ftp.ips.gov.au/users/rwc/>. Comments and suggestions can be sent to www@ips.gov.au

Radio manufacturer joins Internet

Commercial users of the Internet are growing quickly too. As companies learn how to use the information highway we shall see more and more join the bandwagon. **Lowe Electronics**, famous for its range of communications receivers and accessories, has created its own World Wide Web (WWW) page for easy access to range of products. Its URL address is <http://www.demon.co.uk/lowe>.

Gilfer goes online too...

Lowe Electronics isn't the only company representing the interest of shortwave DXers. Gilfer Shortwave is now online with a Web page. A press release from Paul Lannuier, President of Gilfer Shortwave, said he was pleased to announce the release of Gilfer's new World Wide Web page. The address is <http://www.pics.com/gilfer>.

And don't forget Sony...

Sony also has a presence on the Internet with a World Wide Web site at <http://www.sel.sony.com/SEL/consumer/portable/world.html>. So far there are pictures and specs on four of

its range of shortwave radios — the ICF-SW10, ICF-7600G, ICF-SW100 and the ICF-SW77.

Irish shortwave report released

Shortwave DXers have always been keen to log Ireland on shortwave. Unfortunately, previous Irish governments have resisted the move into shortwave but, with many international broadcasters also providing programming via satellite, the Irish have once again looked at getting on the international broadcasting merry-go-round.

The Irish government has recently released a green paper on broadcasting which is now available via the Internet on a World Wide Web page. You'll find the document at <http://www.abc.ucd.ie/broadcasting>. Andy Sennitt tells me that the document is only in html format and is not available for downloading as an ASCII file.

Correction to SBS home page

Due to a slight error, the last edition of CBA left a vital character out of the URL for the SBS WWW home page. The correct address is <http://acslink.net.au/~tomw/sbs.html>.

BBC Improves E-mail address

Many shortwave DXers want to communicate with their favorite sta-

Costs vary widely and wildly — around \$10 per hour seems to be average at the time this article was written.

But many ISPs delight in setting up complex pricing plans that allow you to spend *this* many hours online and download *that* much material over so many weeks, while others have completely different charging schemes. It's not easy to sort out who gives the best value. Again, read the computer magazines and computer sections of daily newspapers such as the Sydney Morning Herald and The Age to keep in touch with prices.

Some 'PC user groups' (computer clubs) now offer Internet access, and if you're a student at a university you may also find that some degree of Net access is possible using PCs on campus, normally in the library.

Finally comes the software. Some ISPs will give you a kit of software to get started, while others just provide the basics and leave you to download the rest.

Putting all this together can be a pain, especially when it comes to setting up and 'configuring' the software so it all works together. Fortunately, there are a few ways to make life easier. My favorite solution is *Internet in a Box* (\$249 from Zircon, phone (02) 317 4055) which gives you a nicely integrated suite of good Net software with excellent manuals and a connection to one popular ISP called OzEmail. You can, however, use the *Internet in a Box* software with any ISP of your choice; it just needs some configuring which the ISP should be able to help you with over the phone.

Another fuss-free path is *Enternet*. This is an Internet service set up by NetComm, an Australian modem manufacturer (phone 02 888 5533). Most new NetComm modems come with a free kit which includes some free connect time through *Enternet*, great software and a copy of *The Australian Internet Book*. You can also buy the Enternet kit separately for \$99.

Where to from here?

If you want to learn more about the Internet, there are few better places to start than *The Australian Internet Book*, which is sold at most book stores (the authors are Geoff Ebbs and Jeremy Horey; it's published by WoodsLane Press, Sydney).

Keep up to date not only with this new column but with Australian computer magazines (most of them have some sort of Internet column every month) and the computer section of major daily newspapers.

And don't forget to ask around — many of your computer friends may already be connected and should be able to help you through the maze.

Next month...

Weaving a Web — we'll show you how to get up and running on the World Wide Web and find your way to some great radio-oriented Web sites and other fun places. *David Flynn* can be contacted at dflynn@msn.com

compiled by Rob Williams

tions or send comments about programming. The BBC saw the advantages of developing electronic mail access last year, but due to the internal rearrangements going on within the organisation and the method of distribution of the mail around Bush House, most of the correspondence has been limited. Now the BBC has created a new e-mail address especially for World Service listeners who want to correspond with the BBC. The new address is worldservice.letters@bbc.co.uk.

Radio Netherlands World Wide Web up and running

Radio Netherlands has been developing its electronic access for many months now and has finally released the address for its World Wide Web page. Its url is <http://www.rnw.nl/rnw>. When you first arrive at the home page you select the language you wish to continue on with. From there you can access RN's skeds as well and heaps of other info. Correspondence to Radio Netherlands can be sent to letters@rn-hilversum.nl.

Web page for IRRS available

The Nexus International Broadcasting Association has recently added a World Wide Web page to enable DXers from around the world to learn more about this unique organisation. Its URL is at

<http://www.nexus.org/> and the shortwave sked is available at http://www.nexus.org/NEXUS-IBA/Schedules/IRRS-SW_latest.html.

South Africa appears on the Internet

The SABC has a Internet appearance at <http://www.sabc.co.za>. The site is still under development, and at the time of writing was adding its domestic sked.

Radio Sweden goes beyond the others on Internet

Radio Sweden is still developing its own World Wide Web site, but has set up a temporary site at <http://www.abc.se/~m8914/media.html> with links to copies of MediaScan and sound archives. So, for those who have access to a multimedia computer, you can not only read information from shortwave stations but also listen to selected programs!

POPCOM online ordering

CQ Communications, publisher of *Popular Communications* (and CQ magazine, of course) announced at the end of May they it now takes orders for its magazines, books and videos via e-mail. As well as carrying its own publications, CQ Communications is also an agent for both the ARRL and RSGB.

Rather than risk the chance of fraud by having customers send their credit

card details via e-mail, users first need to register with the company on a special on-line application form which is then either sent back to them via fax or snail mail.

A customer number is then assigned to each customer, who will use it to order products online via e-mail. To sign-up for this new service send an e-mail letter to CQ@genie.genis.com, NW2L@aol.com, 72127.745@compuserve.com or p0025a@psilink.com.

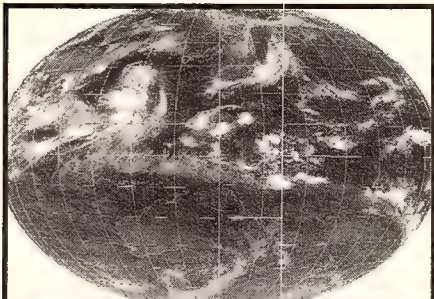
Singapore TV joins Internet

Singapore TV Channel 5 has its teletext pages available on the Internet. The World Wide Web pages include some programming details and information about the various radio services. You can choose to look at its Web pages in either graphical or plain text mode. The URL is <http://www.tech-net.sg/cgi-bin/int-form?5+100>.

Main shortwave URL home page

For those who intend start looking at shortwave World Wide Web home pages on the Internet, a very good point to start at is <http://itre.uncecs.edu/radio/>. From here there are many links to several international and domestic broadcasters to keep you busy for hours.

Enough! See you next month...



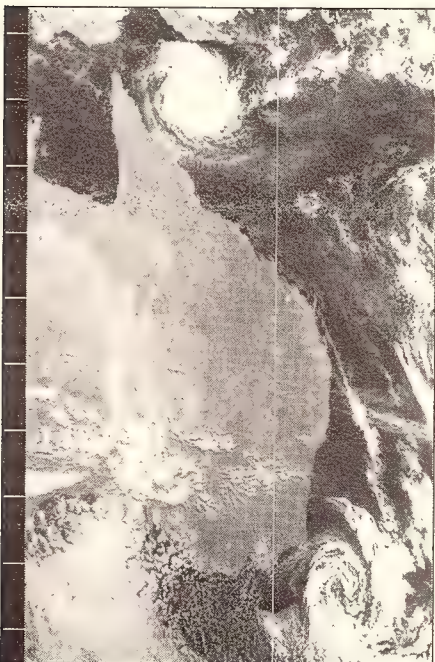
WEFAX SATELLITES

Congratulations to all concerned in the amalgamation of ARA and CBA to make our great new *Radio and Communications* magazine. I reckon it is a great idea and wish it all the success that it deserves.

Things have been fairly quiet on the satellite scene over the past couple of months. **Meteor 3/5** has now replaced **Meteor 2/21**, thank goodness, and the erratic **NOAA 10** has been switched off for the time being.

This month I thought it would be interesting to look a bit closer at the current American NOAA weather satellite scene. During the construction stage prior to launching the satellites are designated alphabetically, ie NOAA-J, NOAA-K etc.

After the satellite has been successfully launched, it is formally handed over to the **National Oceanic and Atmospheric Administration**, (**NOAA**), and is given a numerical des-



ignation. For instance NOAA-J, launched at the end of December 1994, became NOAA 14 after its launch was deemed to be successful. These satellites are in near-polar, sun-synchronous orbits and the equatorial crossings of individual satellites are at fixed solar times.

Currently there are four operational NOAA weather satellites:

NOAA 9 (APT 137.620 MHz). This amazing satellite was launched as NOAA-F in December 1984 and has far exceeded its life expectancy of two to three years. Although several of its ancillary sensors have failed, even after 10 years it still continues to send good quality images.

NOAA 10 (APT 137.500 MHz). Launched as NOAA-G in September 1986, it too has exceeded its life expectancy, but unlike NOAA 9 the quality of the transmitted images has deteriorated and is not expected to be in use for very much longer.

NOAA 12 (APT 137.500 MHz). This satellite, launched as NOAA-D in May 1991, continues to give good HRPT and APT images.

NOAA 14 (APT 137.620 MHz). This satellite, designated NOAA-J, was launched in December 1994 and at present is giving excellent imagery both on HRPT and APT.

NOAA 11, (NOAA-H), was launched in 1988 and gave good service until its demise in 1994. **NOAA 13**, (NOAA-I), was launched in 1993 but failed after a few days due to power supply problems.

Besides the spectral instruments which provide the data for the HRPT and APT images, each NOAA platform also carries a variety of other sensors and sounders. These include the following: the **Space Environment Monitoring System**, (**SEM**) which has two sensors, the **Medium Energy and Electron Monitor** (**MEPED**), and the **Total Energy Detector** (**TED**). The **Solar Backscatter Ultra Violet** (**SBUV**) radiometer allows calculation of UV energy on a global basis. The **Data Collection and Location System** (**DCS**) permits the satellite to relay messages from remote fixed or mobile stations to central receiving stations and supports a world-wide search and rescue (**SAR**) facility.

The satellites also carry the **Tiros Operational Vertical Sounder** system, **TOVS**. This includes a **High Resolution Infrared Sounder**, **HIRS**, a four-channel **Microwave Sounding**

By Arthur Andrews, VK2AAE
Araluen Road, Wollar 2850

Unit, MSU, and a three-channel Infrared Stratospheric Sounding Unit, SSU.

Future plans for the NOAA satellites show that launches are planned until at least the year 2007. There will, however, be some changes to the dissemination of image data. Plans show that, from NOAA-K onwards, the HRPT channels will be increased from five to six, although only five of the six will be transmitted at any one time. From NOAA-O onwards the VIRSR will have seven channels.

From NOAA-O (with a probable launch date during or after the year 2001), it is proposed to change the present APT Analogue transmission to Digital with a data rate of about 72 Kbps and will be renamed as Low Resolution Picture Transmission, (LRPT). Both the HRPT and LRPT transmissions will remain on the same frequencies but their formats will change.

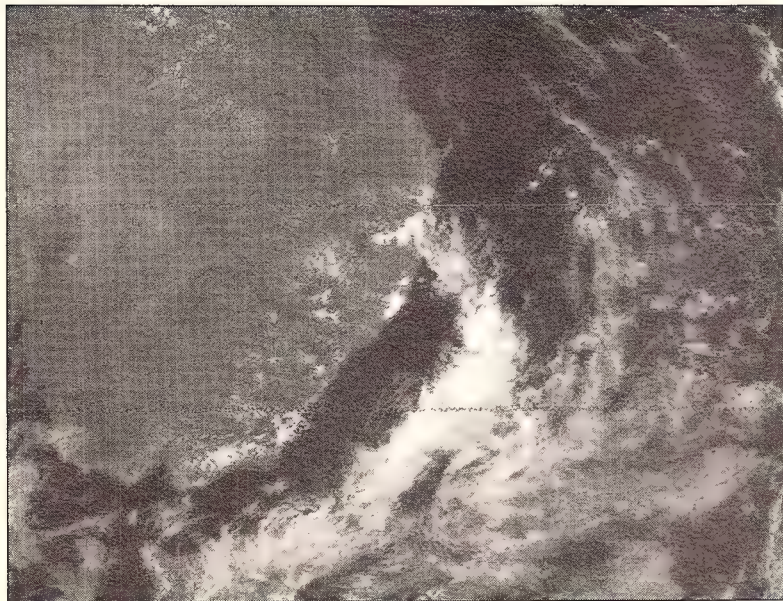
My thanks to *Stephen Galowski* for the information he supplied to me regarding the NOAA satellites.

Tropical Cyclone Agnes put in a very late appearance on April 18 and spun around in the same area for five days until it eventually ran out of steam. We had hoped that it might come down the coast and move inland bringing some drought-breaking rain to our area, but no such luck. I have included a picture of Agnes at her most intense taken from a NOAA 9 infrared image.

My antenna antics continue in the quest for the best antenna for general all-round APT reception from the orbiting weather satellites. I have not as yet repaired the Volute antenna described in the last issue after subjecting it to the drop test.

I ordered a Quadrifilar antenna from abroad for testing and evaluation and a few days ago it turned up, complete with masthead amplifier. Having assembled it as per instructions I mounted it on a 10 metre mast and eagerly awaited the arrival of NOAA 14. To say that I was disappointed with its operation would be an understatement. It appeared to have little, if any, gain and was subject to regular fading bars throughout the satellite pass which would indicate that it has phasing problems. At this stage I have not written it off until I have conducted further tests and made some adjustments.

Over the past year I have conducted tests on a variety of antennas including



the Turnstile, Lindenblad, Egg Beater, Volute and the Quadrifilar, but I always come back to the same conclusion that the Turnstile for overall consistent performance beats them all. This conclusion was further substantiated when **Ron Graham, VK4BRG**, sent me a sample of his Turnstile kit antenna for testing. He obviously had put a lot of thought into it to make it idiot-proof, as

mounted the antenna on the same 10 metre test mast and, although passable pictures were obtained, a lot of phasing and fading bars were apparent. Changing over the phasing harness connections corrected some of the problems but it still did not perform well against the comparison Turnstile mounted at the same height. This I thought was due to it not having any

I had no trouble in assembling it. The test antenna had the optional masthead amplifier included. The antenna had no reflectors but these could be added if needed.

reflectors, so I brought it down and mounted it on a piece of two metre-long pipe whilst I looked for something to make the reflectors out of.

As a matter of interest I left it connected to see how it would perform at almost ground level and was greatly surprised to find that I received a perfect noise-free picture from 5° rising to 5° setting. Obviously this was the correct height above ground to extract its maximum performance.

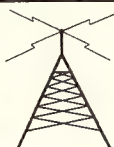
The antenna is now mounted about four metres from any building and, of course, has a clear view of the sky. The image included shows a typical NOAA pass which I am now able to receive which includes the coast of New Guinea which I have always had difficulty with from my location of 32° south in the past. Details and prices of the kit can be obtained from Ron on (079) 56 1155.

Input from readers is always welcome on equipment they are using, antennas they are designing, interesting pictures they have received or problems they have solved which would be of benefit and interest to other readers.

Cheers for now, and see you next month.



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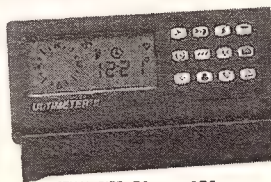
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LARA 3/95 SUPP

Realistic PRO-2035 base scanner

The latest desk-top super scanner from Tandy

By Russell Bryant

They are simple to use, available from stores coast to coast and cover all the frequencies that matter. The Realistic PRO-2035 is the latest from Tandy.

Every scanner user in the country will be familiar with the PRO-2004, PRO-2005 and the now-superseded PRO-2006 with Hyperscan. Unless, of course, you have spent the last eight or so years on an island in the middle of the briny...

Thousands sold world-wide

Designed primarily as base scanners, these popular units offered 300 or 400 channel memories, almost complete coverage from 25 MHz to 1300 MHz, multiple reception modes, and variable search increments. All these features, together with their price, has seen thousands of them sold in Australia, with tens of thousands purchased world-wide.

Well, the King is dead, long live the King! Tandy has taken the best of the PRO-2004/5/6 series and added a few extra attributes, to develop the all-new **PRO-2035**. It's the latest addition to Tandy's extensive catalogue. For those devotees of the 2000 series, the following characteristics of the PRO-2004/5/6 will be well-known: **Hyperscan**, introduced with the PRO-2006, to search or scan at a rate of 50 channels per second. **Monitor Memory**, which saves frequencies detected during search to a temporary memory bank. On the earlier models you could lock 10 frequencies into Monitor Memory. The new PRO-2035 permits 100 frequencies to be tagged.

A **Priority** channel can be set, giving a favorite frequency preference over all others. The scanner will sample the priority channel every two seconds for activity. Unlike scanners that have channel 1 as priority, the PRO-2035 uses a 'floating' priority, in which priority status can be allocated to any channel you desire.

Push button review

Another worthwhile feature of the PRO-2035 is the **Lock-out Review**. Have you ever wondered what channels are locked out of the scan sequence of your scanner? Wonder no more — the PRO-2035, like its predecessors, offers an instantaneous display of all locked out channels at the push of a button.

As today's radio communications systems develop, so too do different transmission modes. Constant carrier voting and trunking networks make scanning difficult. They lock up a scanner almost to the point of making it impossible to monitor them.

The PRO-2035 retains a useful function introduced with the PRO-2004. **Sound Squelch** suppresses carrier signals to permit stopping only on frequencies carrying voice traffic. Also known as *audio scan*, it is a feature which should be included in *all* scanners within the upper price bracket.

If you have operated and are comfortable with the PRO-2005/6, then the PRO-2035 will not shatter your peace. With the exception of a few recent arrivals, all other functions and features are identical to the earlier receivers.

Even the locations of many buttons (in relation to each other) has not changed on the new scanner.

The now-familiar green illuminated LCD display also appears not to have changed.

Zero to a thousand

What *will* strike the devoted Tandy user is the PRO-2035's appearance. It now looks more like a communications receiver than a scanner. Given the frequency coverage (25-520 and 806-1300 MHz), it is not an undeserved image.

The principal addition is a tuning or VFO knob. In its 'normal' mode the knob is a very quick way of moving through the memory channels — and



there's now 1000 of them. I defy anyone to travel from 1 to 999 as quickly using the manual button as you can with the tune knob.

The channel display appears to keep pace with the movement, with no lag evident on the display.

By depressing the Tune key, frequencies can be flicked through at the step rate selected by the user. Again, a quick and easy way of moving about the bands.

In the old days, when searching between limits, any hits were recorded on paper for programming later. In today's technological marvels it is done for you.

The PRO-2035 will automatically store any and all frequencies detected to a bank of your choosing. They can be deleted or reallocated to other banks at a later date.

A key warning...

A key we will probably *never* wear out in Australia is **Weather**. Scanning of 10 pre-programmed VHF high-band frequencies is activated at the push of a button. These frequencies form part of an early warning system that applies to Canada only.

Unless one of your favorite services just happens to use one of these 160 MHz allocations, you may as well forget about it. Perhaps the programming of the Marine 156 MHz frequencies for non-Canadian radios would be more appropriate?

If strong signals are causing interference to a special frequency, two methods can be employed to alleviate the problem. The simplest is to lock the channel out of the scan sequence. However, *all* radio traffic will remain hidden.

A check of the rear panel of the PRO-2035 reveals an attenuator switch which reduces all incoming signals by 10dB, or half their strength. Strong local transmissions will still be heard, with the noisy or interfering station gone. Should you wish to reinstate locked-out channels in bulk, a few simple key steps and presto, all lock-outs are back.

Kiss the scoundrel goodbye

Sharing the back panel with the attenuator is the now-standard (thank goodness) BNC RF connector. At *last* we can kiss those despicable Motorola car radio-style sockets goodbye. These early excuses for external antenna sockets were next to useless. But I digress...

To record radio traffic directly from the PRO-2035 a Tape Out socket is sup-

plied. An Extension Speaker jack permits connection of a suitable remote speaker for monitoring in noisy environments.

Power is supplied via a mains cord connected to the 240 VAC supply. Should you wish to use the PRO-2035 mobile, a 12 VDC lead can be attached. I would have hoped by now that the AC cord would be a detachable one. But alas not. The cord and the Weather hot key are the only two criticisms I can fault the PRO-2035 on. The cord is particularly disappointing, especially since I know the matter has been raised with Radio Shack on a prior occasion.

School's out

I have discovered that there are two schools of thought regarding Tandy scanners: those who swear *by* them, and those who swear *at* them. Personally, I have no problem in owning or using the Realistic gear. After all, the PRO-2035 performed without fault. I found all functions easy to use. Push buttons responded with a beep and had a positive feel about them.

The bottom line? Without hesitation I would recommend the PRO-2035 to any scanner enthusiast, be they new or experienced. The new radio offers plenty. High-capacity memories, wide frequency coverage and, more importantly, ease of operation.

One more thing that endears the Realistic to me, and this may seem surprising, is its sensitivity figures.

The quoted figures are rather conservative. Instead of building a receiver that will hear a man in the next block sneeze, Tandy has wound the figures back a bit.

All this means that the scanner user can connect the PRO-2035 to an active or high-gain external antenna without suffering interference. Directional aerials also complement the scanner, again without causing tremendous overloading of the front end.

Finally, the user can stick to default tuning steps or choose their own.

In conclusion

Overall, performance of the latest desk-top super scanner from Tandy exceeds that of the popular PRO-2004/5/6 receivers on which it is based. The tuning dial and auto store functions are welcome additions.

I would rate the receiver 7 out of 10 — and remember, there is *never* a ten! It drops points only for the fixed AC lead...

The review unit was supplied by **Tandy Electronics**, and has an RRP of \$799.95

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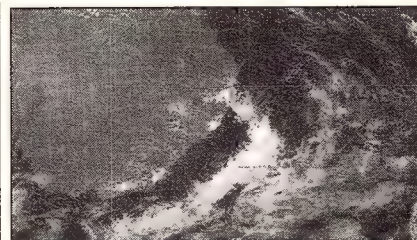
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EQUIPMENT EVALUATION

One of the axioms about life I am starting to believe is this: "if something is fun, tastes good, feels good or looks good, desist at once — it is *bad* for you". Such, I am afraid, is the case with some aspects of amateur radio. I wish to illustrate one particular example of such aspects, that involving the evils of unused RF.

One sheer joy for me is to switch on the rig and have a chat (read: chin wag, QSO, rag-chew) with some unsuspecting bod at the other end of the airwaves. That, after all, is one of the main points of the hobby. The problem, you see, is that some percentage of the RF emitted from every rig goes in directions other than that of the station you are yakking at. The deviant behavior that such unused RF exhibits forms the 'bad for you' part of the axiom I just quoted. Let me give you a simple example. One watt of RF output from my rig on two metres cannot do much wrong — except that the other stations often cannot hear me.

If I increase the output to, say, 10 watts, they then hear me okay, but now the nasty percentage of spare and rebellious RF has built up to sufficient strength to 'do things'. Here, it heads right over the side fence and into the electronics next door, resulting amongst other things, in their outside 'sensor' lights turning themselves on. This is usually followed by an FBI-style raid by the neighbors of their yard. They haven't yet figured out that it is me doing it, but if (when) they do, that unpleasant business of the garbage transfer will probably start again.

Now be honest, dear reader. Haven't you run into trouble with loose RF heading into troublesome nooks and crannies at some time? Don't tell me that *all* of your transmitted RF energy makes it to the other station or that any deviant RF emitted by your rig merely warms up resonant sections of local buildings, bridges and the like rather than undertaking some form of devilous prank. No, spare RF has a mind of its own and will almost certainly obey a new form of 'Murphy's law' and do the most embarrassing things.

Two of you out there provided my second example. Let us call them persons A and B. These two are well known to the fraternity, I might point out. Person A was mobile with 50 watts of FM on two metres and said to person B "I am pulling up outside the

auto-teller so hold on a minute".

Being late at night, person B responded with "Fine, I'll still be here.". The deviant component of spare RF from person A's RF had, however, already done its damage. The alarm systems of no fewer than two of the local banks had been tripped, sounding off at *high* volume in the main street and alerting the police. Person B was amazed at person A's brevity at the banking stop over — less than 10 seconds! Let's not recount the rest of the story though.

Another bloke I know, given as he may be to fanciful story-telling, swears he knows a special frequency for setting off the car alarm for one particular version of the Holden Commodore.

WHAT TO DO WITH UNUSED RF

By Neil Duncan, VK3ND

The beauty of this trick is that the alarm need not even be armed. If you are driving along behind one of these cars, dial up the frequency, press transmit (announcing your call sign, of course) and soak up the resulting chaos. These examples are available with spare RF even if there is no modulation — but what if you can be heard?

Audible RF

Now, one advantage of the FM mode is that the emitted waves, including the deviant portion, are of fairly constant amplitude. That is, porch lights, alarm systems, herringbone patterns on the telly and the occasional busted pace-maker are about the limit of FM's destructive power, since the audio component won't be captured by simple rectification. The other modes present a different matter since they can be heard, with AM (Ancient Modulation) being the worst.

Some of us can bask in golden memories of the good old days on 53.032 MHz AM.

Not so for one Ringwood amateur I knew — he has one dark memory of such operations. Being of good excuse one particular Sunday morning, he dropped his wife and kids off at the church and drove off (around to the other side of the church) to sit out the

appropriate hour. What better way to while away the time by chatting to someone on six?

"G'day Fred," our man babbled into the microphone. "I've dumped the wife and kids off at church to be bored out of their brains by the stuffy old bible-basher there. By *gawd* I'm glad I got out of it! How are you going?"

I have often wondered if this bloke would have toned that over down a little if he knew he was being re-broadcast at absolutely *full* volume inside the church. The aberrant percentage of RF in this case had found its way into the church's PA system — ahead of the volume control.

Not all aberrant RF leaves one's own domain though. One component of my stereo system is the sub-woofer. My spare 200 watt MOSFET amplifier is pressed into service as a bass-only driver for a real gut-rumbler of a speaker I purchased from Jaycar. This system sounds great with cello or double bass passages, but I did discover one weakness recently. Admittedly, it only responds to spare RF when I am on 20 metres with the linear on, but the memory of my discovery of that particular fact still lingers on.

Just the 'C' of 'CQ' was enough to make me jump. Had the house been struck by lightning? Was there an earthquake? Good *grief* that was loud!

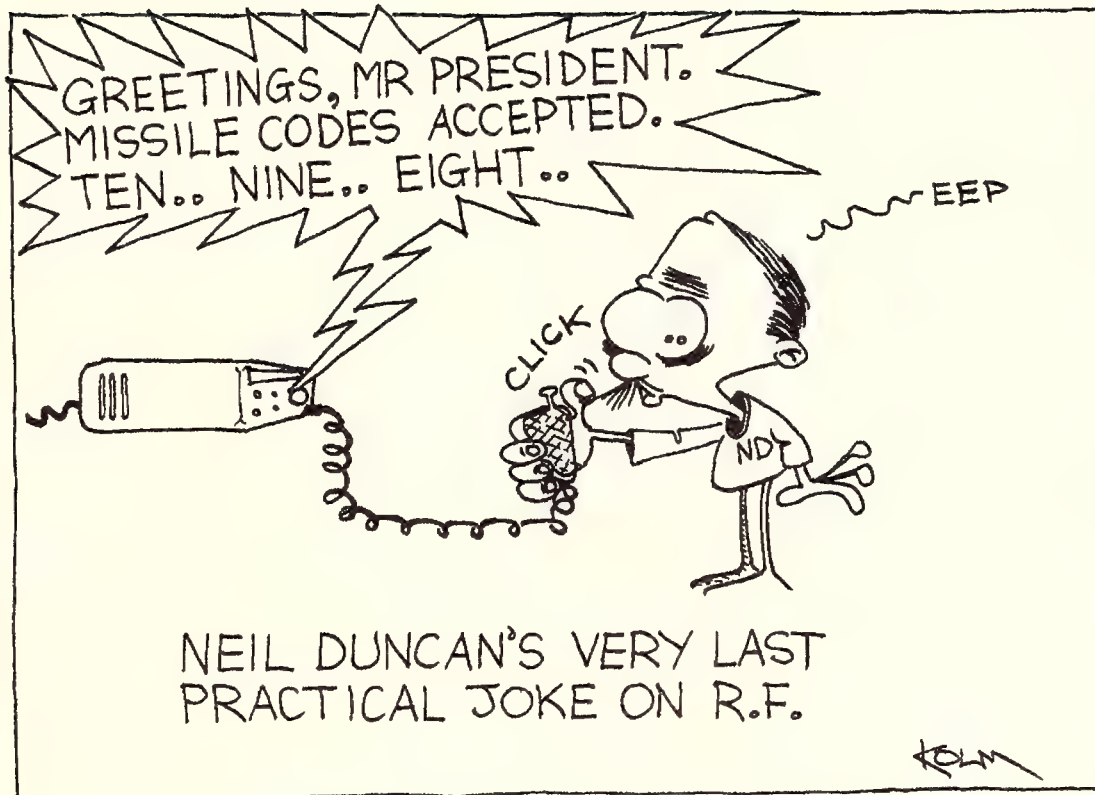
Partially-audible RF

If you don't believe this one, I'm tempted to say 'pop around and I will demonstrate it to you'. Perhaps not — there are too many of you.

If I beam slightly south of east and send CW on 10 metres (again with the linear on), somewhere out there in the direction of Bayswater, unused portions of my expensive RF find their way into someone's house alarm.

No, the thing doesn't just sound off, that would be too simple. Instead, it squawks in unison with my sending. It is really quite fascinating. Let's say I send -- • and hush up for a moment. There it is, a faint DE comes back to me through the still night air. About 10 WPM is its maximum speed. Perhaps I could subliminally teach CW to the good residents of Bayswater in the wee hours of the night when they are asleep.

Unresolved sideband coming through your stereo speakers has a particularly annoying, Darth-Vaderish sound to it I reckon. Various members



of my family have several tapes with my unresolved SSB dubbed over the top of their recordings for example (which in many cases, enhances the quality of the recording I reckon). Knowing the mess it can make, consider the joy I had therefore when I found I could get into the hired juke box system the neighbors had put in the backyard for their son's 21st birthday party recently!

These are good neighbors and, admittedly, they *had* warned me that the party was coming up. But by 1 am, the sounds of heavy metal sufficiently loud to make things in my house move in unison, neighborly relations were becoming a little strained. So it was *on* with the rig, *on* with the linear and pump a little sideband up the coax. Superb — the well-trained spare RF had homed in on the juke box!

Unfortunately, nobody next door even noticed. Indeed, I debated running AM with the view of broadcasting a pointed "turn it down — **NOW** — or we'll push the 'destruct' button" announcement.

However, a peek over the fence revealed multiple tattoos, weight-lifting bodies wearing tank tops and nose rings — and some ferocious-looking men too!

Discretion being the better part of valor, I switched the rig off, put earplugs in and read a book while the earthquake continued around me.

Mobile RF

When Channel 0 television was introduced in Melbourne back in the dark ages (1964!), there was a particular game one could play. You would drive along a suburban road at night, and outside each house in turn you would press the PTT button on the six metre rig a couple of times. If the emitted light in the front room flashed and danced with the PTT presses, *that* family was watching Channel 0. It didn't take much power either. I reckon if you just thought the words 'six metres', you could almost cause TVI. Sadly, those fun days are over.

There is a modern-day equivalent to replace this elegant Saturday night activity, you will be pleased to know. Imagine a long, long hallway with a seemingly endless row of ceiling lights installed on it. Each light is controlled with its own switch on the wall. Now imagine running down the hall switching each light on as you pass it. Sound like a silly experiment?

My new 'spare RF' activity is based on this analogy. Simply hold down the PTT on your six or two metre FM box (again, with call signs of course) and drive down almost any modern suburban street at night-time.

Most people, it seems, have installed one of those clever movement-sensing porch lights on their house and, as far as I can see, they are *all* designed to respond to spare RF.

Ding, ding, ding, ding, they all switch on as you drive past. Fascinating! And isn't it *fun* seeing which ones respond to six metres and which ones respond to two!

Modern stereo gear installed in cars is not immune to spare RF by any means either. My HF SSB mobile gear has a cunning component of spare RF at its disposal for just such a target. More than once the following has happened: I am at the traffic lights waiting for the green light. It is my turn to transmit so I flip the PTT and talk (using my hands-free adaptor, of

course — holding a microphone while driving is illegal here).

Simultaneous with the first transmitted word, the people I am looking at in the rear view mirror jump and twist about in horror, trying to evaluate what is happening to them — the end of the world is nigh perhaps? They are the ones with 'full RF sensitivity' in their stereo system. The ones who hear a more normal audio level merely laugh and point at my antenna.

Conclusion

So what is the point of all of this tale-telling? My thoughts on the matter go like this: there seems to be an increase in the number of electronic components which are being sold to the public with *extremely* low immunity to RF interference. The porch light example is a good and inexcusable example. Such a situation is not all that satisfactory for the amateur radio fraternity. Now, I managed to fix my subwoofer 'problem' with one ferrite bead and one 0.001 pf capacitor, so I reckon finding cures for such ills is not all that difficult.

Perhaps if we all sent off a little bag of ferrite beads, capacitors and a few other bits and pieces to the makers of VCRs, stereos, audio gear, movement-sensing porch lights, alarm systems and so on, and included some basic instructions with them, they would get the hint...

BUSHCOMM'S MULTI-PURPOSE HF BROADBAND ANTENNA

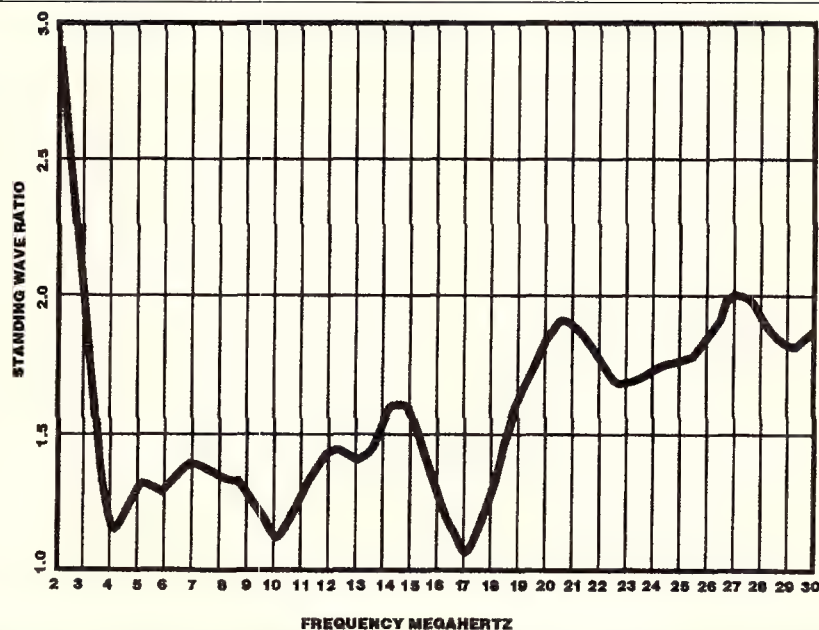
About 12 months ago we reviewed one of Bushcomm's wire antennas and were extremely impressed with both the quality of its construction and, importantly, its performance.

The latest unit, the SWE-100, is once again extremely well constructed and as good as anything of a similar nature that we have yet sighted.

Bushcomm claims that "...when installed permanently, as a base antenna, the unit offers comparable performance to longer, much more expensive wire antennas and will handle 250 watts PEP from 3 to 30 Megahertz...". Now we can't comment about the "comparable performance" as we do not have the necessary "more expensive wire antenna", however, we will confirm that it works very well across a wide range of frequencies and it stayed pretty close to Bushcomm's SWR graph (see below) and will handle the claimed 250 watts PEP without a worry.

As it covers all RFDS, HF CB, OTC, amateur frequencies (and pretty much anything else you can think of) it will have plenty of attraction for a wide range of operators, not the least of which will be owners of 4WD vehicles who will find it to be an great little portable package — particularly for emergency use.

Bushcomm has recently released a new multi-purpose HF broadband antenna which can effectively be used as a permanent, end-fed antenna or as a multi-band portable device ideal for 4WD, field day ops and HF-CBers.



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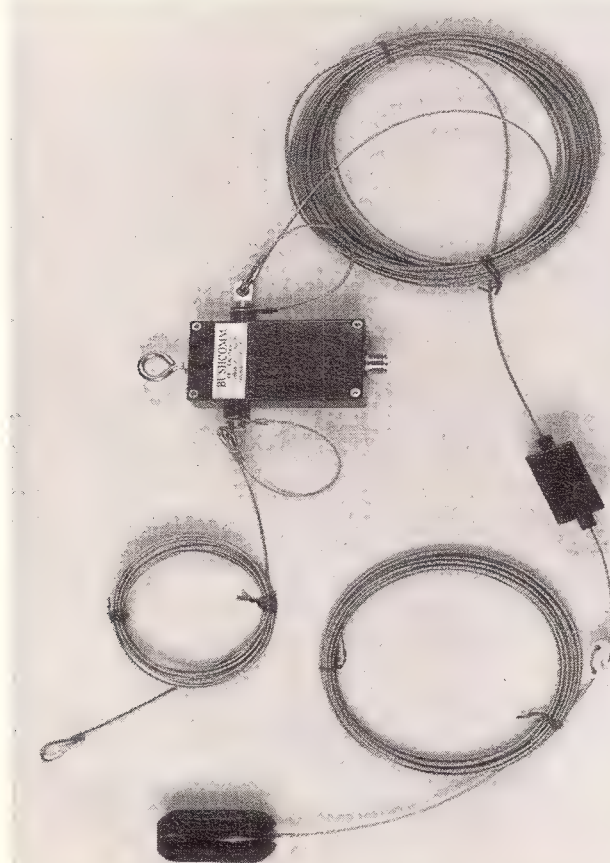
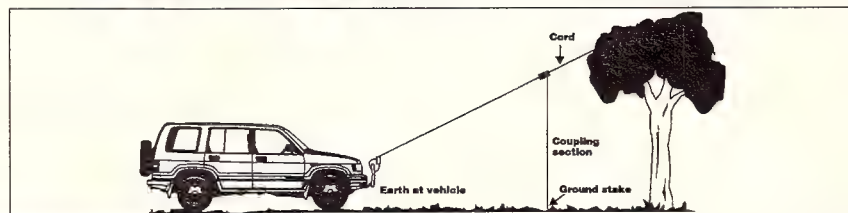
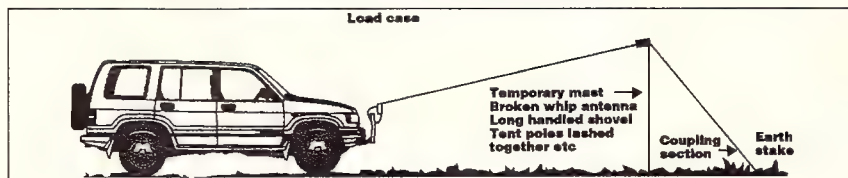
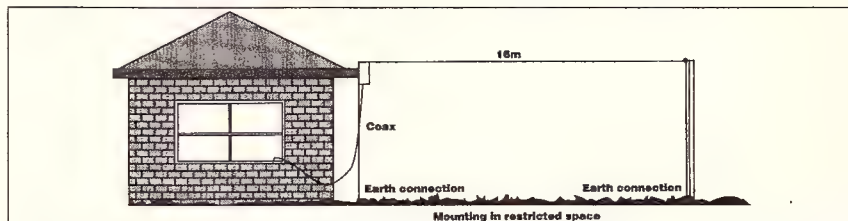
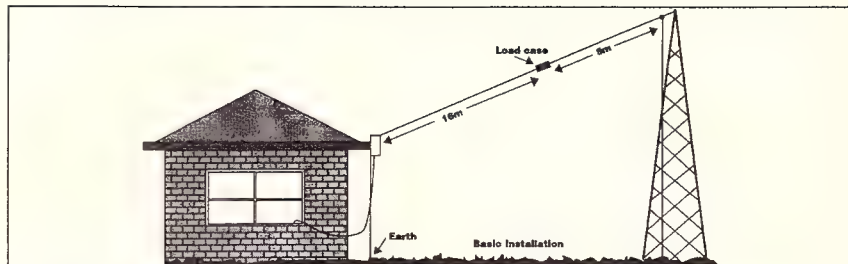
Refer to the diagrams on opposite page for ideas on how it can be used.

Off-roaders tend to break mobile whips like there's no tomorrow and from personal experience I can tell you that it's not much fun trying to string a long piece of wire through the surrounding foliage and then, in the absence of an antenna tuning unit, trying to trim the rotten thing down to a useable frequency. This is even *more* fun when it's pouring rain.

The unit itself is ruggedly constructed of stainless steel wire and fittings and, with metal component housings, is very definitely built to last. It has a huge range of applications as a permanent base antenna and beats the hell out of the proverbial "random length of wire" used by so many SW listeners. Commercial base stations will also find that it's the ideal antenna for keeping in touch with their mobile outback HF stations while CBers can use it for operating on 11 metres and listening elsewhere.

Overall, it is a very nice piece of equipment and right up to the high standard expected from this small, but quality-minded company.

The price of the SWE-100 is \$222. Graham Robinson at Bushcomm, 92 Princes Highway, Murray Bridge 5253 ('phone (085) 32 5110) is the man to speak to...



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A Multi-Band Bi-Square Antenna

By Steve Ireland, VK6VZ/G3ZZD

Just a few months ago my wife and I moved house, for the second time in six months. Once again, the quest to build a competitive HF DX antenna system was on!

At our original home, in the Perth inner suburb of Nollamara, the HF antenna system had been pretty formidable — a three-element monoband Yagi for 20 metres and a delta loop for 40/15 metres with the apex at 45 feet. The stop at the next house was brief, and parallel sloping dipoles for 40/20 metres had been erected, with the highest point of the antenna at 55 feet. The results had been serviceable but disappointing when compared to the Nollamara antenna farm.

Now we had moved a mere 200 metres to a QTH which was virtually identical as far as radio was concerned to the last one. As the dipole had proved so disappointing on 20 metres at the previous location, something different — and better — was needed for an antenna.

I have a schedule every week on 20 metres SSB with my father, GØTYJ, who lives in south-eastern England, and the sloping dipole had proved useless for this — I couldn't hear him and he couldn't hear me! My favorite band is 40 metres and, although the dipole had been an adequate performer this band on the long

and short paths to the US, it was not a patch on the old delta loop.

My main concerns were for good 20 and 40 metres DX performance, coupled with the ability to use the antenna on all the other HF bands from 160 to 10 metres. I considered trying an 80 metre horizontal loop, along the lines of the *Loop Skywire* (ref 1) in the **ARRL Antenna Book**, but the trees at the new QTH were in all the wrong places.

Far the best natural antenna support lay in one corner of the block, a 50 foot-plus pine tree. Armed with a bow, lightweight arrows tipped with Blu Tack and a lot of fishing line, I managed to get a line over a branch at a little over 45 feet. Whatever antenna I was going to use in the short term, until I got planning approval for a tower, would have to be hung from here.

I considered putting up a 40 metre delta loop and feeding it with 300 ohm ribbon or open wire via an ATU. That would work brilliantly on 40, but on 20 metres there would be a lot of wasted radiation at high angles. I decided to read a few more antenna books and brood a little longer.

One evening I talked on the telephone to my friend, Kevin, VK6LW. Kevin had used a bi-square antenna on 20 metres (see **Figure 1**, below) for some time with

great success and reckoned that its performance was better than any single-element wire antenna he had tried on this band. Looking through my books, it offered a genuine power gain of at least 3dB over a dipole (ref 2).

For the uninitiated, the bi-square (Figure 1) is a derivative of the old 'Lazy H' antenna, and consists of a two-wave-length loop in the vertical plane, open-circuited at the top of the antenna opposite the feedpoint, and usually configured in a diamond shape. As its name suggests, it is bi-directional.

The radiation pattern is a figure-8, similar to that of a dipole. With the top of the antenna mounted at 45 feet, most of its radiation should be under 20°, just right for DXing.

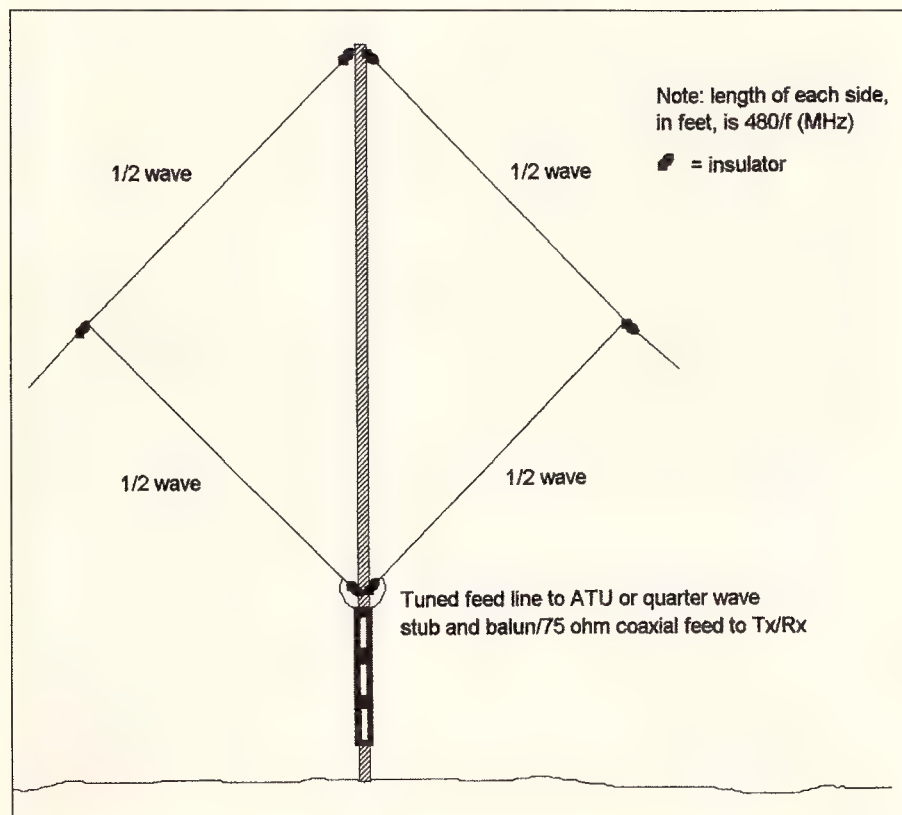
Each side of the classic bi-square has equal components of horizontal and vertical radiation (see **Figure 2**). As you can see, in theory, the vertical components will cancel each other out, leaving the four horizontal components, which are in phase and provide the gain and horizontal polarisation.

Reading further, I discovered that the bi-square can be used at half its design frequency, so a 20 metre version would also work on 40 metres. However, instead of broadside horizontal polarisation as on the design frequency, end-fire vertical polarisation resulted at half frequency.

Whilst I didn't mind the vertical polarisation, end fire radiation meant most of my signal was going to end up in the Arctic and Antarctic, rather than in Europe and the USA where I wanted it! Also, for reasons of space, I really wanted to use a triangular rather than a diamond shape of loop for my antenna. Some more planning was clearly needed...

When I thought about it, the only major physical difference between a 40 metre full wave loop (with broadside radiation) and a 20 metre bi-square was the fact that the top of the bi-square was open-circuited. Also, a bi-square is usually shown in a diamond or square configuration, but I could see no reason why it should not work configured in a triangle or delta shape, although the electrical symmetry of the antenna was upset to some extent.

All I needed to do was to insert a open-circuited 40 metre quarter wave stub into the top of a 20 metre bi-square in triangular configuration and, hey presto, I had a 20 metre bi-square and a 40 metre horizontally-polarised delta loop in one. The quarter-wave stub, open-circuited at the far end, would be at a low impedance at the antenna end of it on 40,



electrically closing the open circuit at the top of the antenna on that band.

However, I still had a few doubts. My previous 40 metre delta loops had all been corner-fed to achieve vertical polarisation, but Kevin assured me that, because of all the trees surrounding the houses in the area we lived in, horizontal polarisation would probably work better.

Anyone who has tried a vertical antenna

amongst a lot of trees will know what Kevin was talking about! Under these circumstances, sometimes the antenna works well, sometimes it doesn't, due to unpredictable absorption of the vertically-polarised radiation by the vertical 'sappy' trees.

On 40 metres, the feed impedance of my hybrid antenna would be 100 to 150 ohms, but on 20 metres it was going to be in the order of several thousand ohms. In order to reduce this to a low impedance more easily managed by an ATU, I decided to feed the antenna with a length of slotted 300 ohm ribbon corresponding to an odd number of quarter wavelengths, giving an impedance in the vicinity of 50-100 ohms at the ATU.

As the feed point of the antenna would be around 80 feet away from the shack, I opted for a feeder length of seven quarter wavelengths on 20 metres — slightly over 100 feet, assuming a velocity factor of 0.87 for the slotted ribbon. This length also looked as though it would allow easy low impedance matching on most of the other HF bands using an ATU.

So what the antenna likely to do on the other bands? As the top of antenna was electrically open circuit on all bands 160 to 10 metres except for 40 and 15 metres (don't forget the stub will close the top of the antenna on this latter band, too) the impedance of the antenna on the bands below 40 metres should be high enough to be matched with a Transmatch or Z-match — even on 160 metres.

On 80 metres, it seemed that the antenna would look like a kind of folded up semi-vertical dipole, with some hori-

zontal and vertical radiation. On 30 metres, it would be a slightly folded up bi-square, with the stub increasing the electrical size of the antenna loop to close to two wavelengths on this band and horizontal polarisation.

What would happen above 21MHz I really wasn't sure, but at this stage of the sunspot cycle, who cared! Whatever, the antenna would certainly radiate and might even show a bit of gain.

Construction

The aerial was erected in the configuration shown in **Figure 3**, made of a single conductor of 24/0.2mm 'figure-8' electrical cable purchased from the local hardware store, using plastic shower curtain rings as insulators.

The dimensions of the loop are not critical and the vertical sides were made a little shorter than the bottom side, in order to raise the latter as clear of surrounding objects as possible.

In order to keep the antenna as symmetrical as possible and keep the stub in the same plane as the antenna, an 32.17 foot length of ultra-violet proof nylon cord is run from the insulator at the apex of the antenna to the insulator at the antenna feedpoint. The cord is threaded through the slots of the stub, made from 28.7 feet of the 300 ohm ribbon and secured to the insulators.

The ribbon feeder was supported in a similar fashion to the stub by running nylon fishing line through the slots and supporting the feeder using the line a few feet above the ground (see **Figure 4**). Try to keep the ribbon away from other feed

Note that horizontal components of radiation are shown as a, b, c and d and add. Vertical components are 1, 2, 3 and 4 and cancel.

Figure 2 - How a bi-square radiates

cables by at least six inches and avoid running it close to metal objects.

A word of warning here. Make sure you buy good quality UV-resistant slotted 300 ohm ribbon from a reputable supplier. The unslotted stuff sold by hardware stores tends to break in strong winds and will also cause your SWR to vary enormously whenever it rains.

Incidentally, some radio amateurs who have used the slotted ribbon have recommended to me that it is further

slotted to lessen any remaining effects of moisture. Cutting out each alternate solid piece of the slotted ribbon is said to virtually eliminate any major effect of moisture on the ribbon, whilst still keeping it mechanically rigid. I certainly intend trying this on my bi-square feeder before the winter rains arrive!

Performance

After a false start due to a wiring fault on my home-brew Z-match ATU (many thanks to Phil VK6APH for spotting this), and with the antenna erected to fire in NW/SE directions, my multi-band bi-square worked like 'a bomb'. On 20 metres, despite a large hill in the way, I found I could work Europeans on the short path much more easily than with the previous dipole and, when conditions were good, even my Dad in the UK. Signals into the US were excellent, especially on the short path, and S9 reports were received, running 400W.

The biggest surprise came on the low bands. On 40 metres, the antenna has proved to be superb, considering the limitations of my QTH, with rising ground from the West around to the North East. During the CQ WW SSB Contest, I decided to try the antenna on the short path to the USA around 1200z. The result was the biggest pile-up I've had in my life — including the time I operated from Christmas Island as VK9XZ! In under an hour, I worked 58 North American stations using 400 watts and an old Kenwood TS-830S/SB-220 station, despite the usual contest QRM.

The antenna's performance on 30

metres also proved excellent, with a couple of hours' casual CW operation producing contacts including J28GR (through a huge pile-up), 4U49UN and a variety of European and North American QSOs.

On 80 metres contacts were made around Australia on SSB with S7-S9 reports. No real attempts have been made at working DX on this band due to a lack of opportunity, but the performance on receive certainly seems promising. At present, the antenna doesn't like loading up at the CW end, probably due to the length of the feed

line. A short length of coiled-up 300 ohm line, added to the antenna for 80 metres CW only, should cure the problem.

With the recent purchase of an MFJ Versa Tuner V, the antenna was tried on 160 metres. Only local contacts have been made so far, but the antenna loads and certainly radiates, despite its very low impedance. The aerial also loads easily and radiates well on 18, 21, 24 and 28 MHz, although it has only been used to any extent on 21MHz, where a number of contacts were made with Asia, North America and Europe during the CQ WW SSB Contest.

Conclusions

The multi-band bi-square offers performance on 40/30/20 metres — the bands most generally useful to radio amateurs at this stage of the sunspot cycle — which exceeds by far the performance of any single element multi-band wire antenna I have ever used. On 40 metres, it is a real 'pile up buster' and works as well as my old single-band delta loop. On 20 metres, whilst offering no challenge to my old three-element monoband Yagi's performance, it is a far better DX antenna than the previous half-wave dipole.

On 80 and 160 metres the performance is very useful; it does not need an earth system and can be fed as a balanced antenna, with consequent relatively low noise on receive. On the other hand, I'm looking forward to see how it performs on those bands fed against

earth as a vertical next winter. Above 20 metres, I haven't spent too much air time, but the antenna seems at least as good, if not probably better, on 18/15/12/10 metres than G5RV and W3DZZ-type antennas I've used in the past.

I've now tried my multi-band bi-square in both delta and diamond configurations. Although the latter should produce the better performance owing to the top and bottom halves of the antenna being truly electrically symmetrical, the former configuration seemed very marginally better. This is due, I believe, to the better average height of the delta configuration.

The antenna is cheap to build, and all it needs is a single support of 40 to 50 feet and an ATU with a balanced output, such as a Z-match or a Transmatch with a balun. My home-brew Z-match and MFJ Versa Tuner V (with its current balun re-configured as a conventional 4:1 balun) tune the antenna equally well.

Future plans include the installation of an earth system underneath the multi-band bi-square to see how it does as a vertical on the low bands, and the installation of an identical second element behind it. With assistance from VK6APH, I'm working on a matching/switching unit which will allow me to change the direction of fire of a two-element multi-band bi-square array through 180°.

Anyway, that's all in the future. For now, I'm just enjoying how well my multi-band bi-square works.

Why don't you try one too?

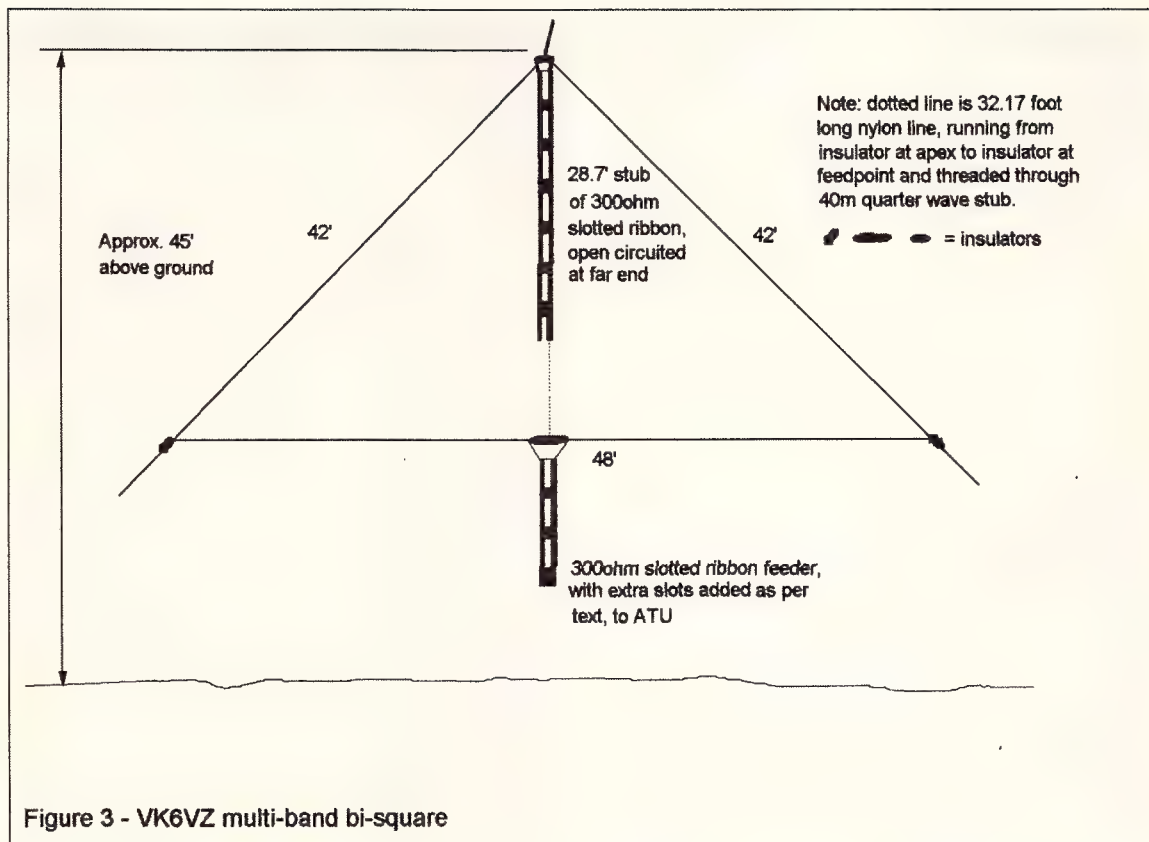


Figure 3 - VK6VZ multi-band bi-square

References

(1) **ARRL Antenna Book**, 15th Edition, page 5-17

(2) **ARRL Antenna Book**, 15th Edition, page 5-22.

Curiously, in the copy I have, the bi-square is said to have vertically-polarised radiation on its operating/design frequency. Other books I've read (ie **All about Cubical Quad Antennas** by Bill Orr, W6SAI and Stu Cowan, W2LX (Summer Hill); **Practical Wire Antennas** by John D Heys, G3BDQ (RSGB) say it has horizontal polarisation).

I tend to go along with the latter school of thought, but sometimes on receive, when there is rapid QSB on a DX signal, it does sound very like a vertically-polarised antenna...

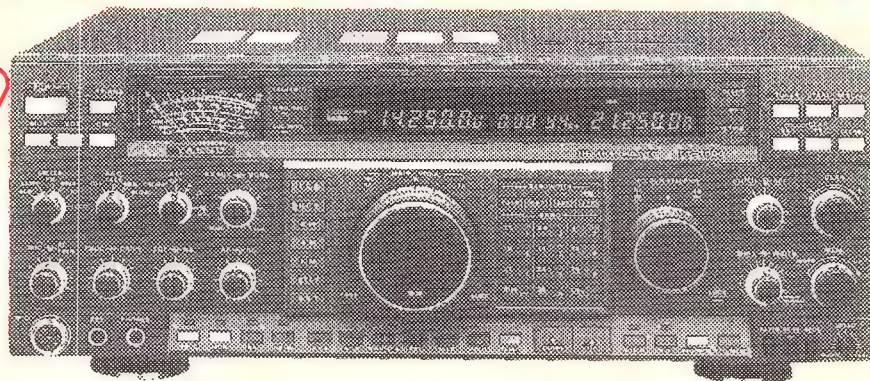
(3) A 40 metre full wave loop and a 20 metre bi-square differ slightly in their theoretical physical size, with the latter being slightly smaller than the former.

This is because, as most good antenna books will tell you, the bi-square is not really a loop antenna at all, but two collinear dipoles fed in phase.

My multi-band bi-square is cut to the dimensions of a 20 metre bi-square, rather than a 40 metre full-wave loop. However, with tuned feeders, the slightly short 40 metre loop performs beautifully — see text!

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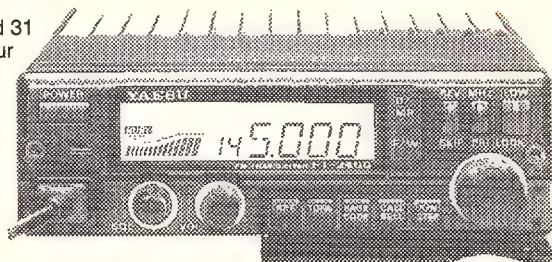
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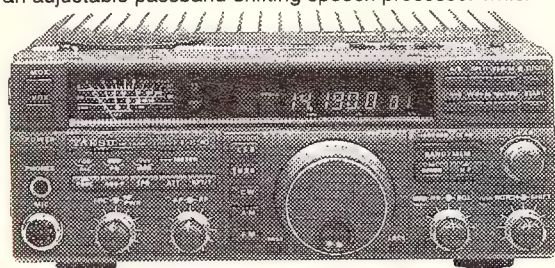
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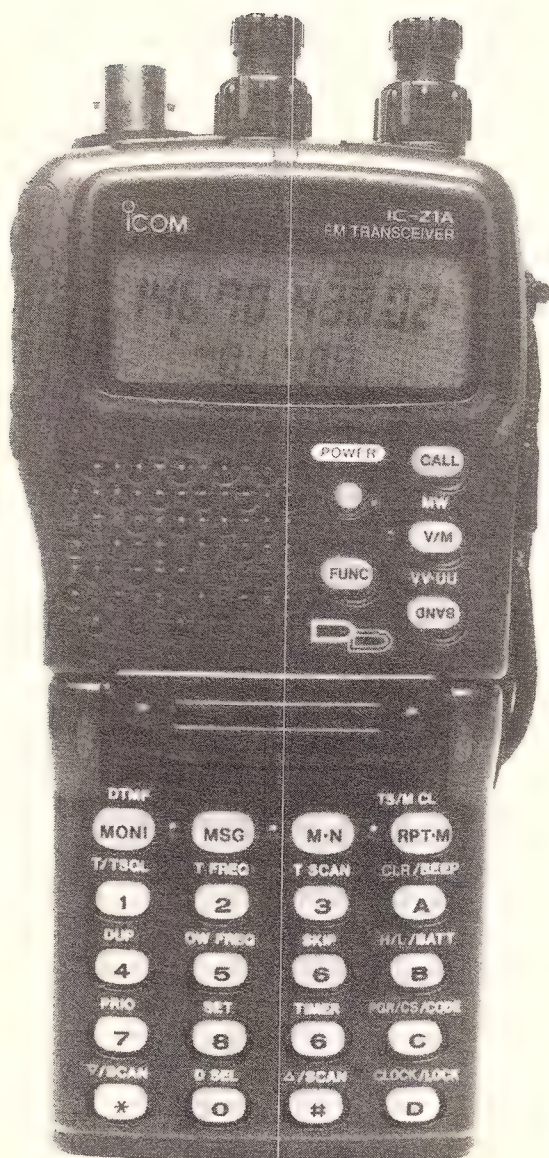
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Okay, so what's wrong with the photo at left?

1 _____

2 _____

The business of communications journalism changes constantly, and so here I am again, once again working for Len Shaw, in this brand new magazine. Sure, I have all my other writing interests, but this column is going to be unique, offering a slant on aviation monitoring which 'On the Airbands', 'Flightwatch', and all the other columns I handle do not embrace. We are going to examine two or three important issues of interest to aviation monitors, and discuss them in some detail, a luxury not entirely afforded me in other magazines.

It was fascinating to see the Civil Aviation Authority take out double-page tabloid and broadsheet advertisements explaining the operations of the new Sydney parallel runway 16L/34R, and why it was necessary to build it.

Sydney Airport is the gateway to Australia, and the CAA presented diagrams to point out that having parallel operations is much safer than the cross-runway system of 16/34 and 07/25.

On April 3, the new control tower came on line, allowing full utilisation of RW 16L/34R. Until then, operations had been stifled due to controllers not being able to fully see all parts of the new runway complex.

With the new tower, and its 360 degree view and surface movement radar incorporating high-resolution color screens, the controllers know exactly what's moving and where, in all weather.

Early 1996 will see the new PARM (Parallel Approach Radar Monitor) system installed, which will allow side-by-side approaches to the parallel runways in all weather. PARM will keep the two approaching aircraft safely and accurately separated in any of the following directions: nose-to-tail, wingtip-to-wingtip, and in altitude.

Once PARM is on line, Sydney Airport will be up there with the world's best. Two VHF frequencies which disappeared in 1995 from Sydney Airport — namely 126.1 Approach, and 125.3 Departures (replaced by 128.3 and 129.7 MHz) — will re-appear on the introduction of the PARM equipment, and will be used to take aircraft from mid-downwind leg to when they join final. Turning final, the aircraft will change to Tower frequency.

The designations for 126.1 and 125.3 will be, in order, 'Sydney Director West', and 'Sydney Director East'. The transmitter antennas will be located at the airport itself. Another new frequency, currently on test, and frequently being combined with Departures South on 129.7 MHz, is 118.4. It's located in the Blue Mountains, west of Sydney, and it will eventually be split and used on a separate ATC position when traffic demands it. The call sign, so I'm told by my CAA spies, will be 'Sydney Terminal'. This will be independent of the 135.1 MHz operation now using that call sign.

Tower Talk

A great little story was recently told to me by Rod Pascoe, a colleague of mine in 'Australian Aviation' magazine, and I'd like to pass it on to you.

In Flight

with Bob Bell

A British Airways Boeing 747 was on approach to Darwin, and the crew was told by ATC on frequency 134.1 MHz to orbit to avoid a thunder squall right across the path of the descending jumbo.

The Captain came up on the radio, very pompously, and said something along the lines of this: "Approach, Speedbird 15. My dear chap, do you realise that holding and diverting costs my company thousands of pounds?" The controller, not to be stood over, replied "Speedbird 15, roger that. In that case, can you make 400 pounds worth of left-hand orbits for me?"

Abstracts...

• On August 31, 1983, Korean Air 007 was shot down by a rocket from a Soviet 'Flagon' fighter. The passengers and crew, comprising 269 innocent civilians, died instantly. Shock waves reverberated around the world. Subsequently, the Soviets claimed that the fighter pilots had attempted to contact the 'straying' airliner on the international VHF emergency channel 121.5 MHz, and there was no reply. In fact, the Soviet aircraft was not fitted with VHF 121.5, as Soviet military leaders at that time believed that this frequency may have assisted their pilots to defect to the west.

Retired US Air Force Chief-of-Intelligence Major General George Keegan Jr stated that he had "...personal knowledge that the SU-15 fighters were equipped with 121.5...". Regardless, neither SU-15 Flagon pilot spoke English, so it wouldn't have mattered anyway, whether or not they had the frequency.

Now that the Soviet Union has broken up into individual nations, US and Russian crews use 121.5/243.0 MHz when they come into view of each other. If it becomes necessary to exchange further information after initial contact, they switch to 130.0 or 278.0 for sustained voice communications, and they convey information using laid-down mutually-agreed phrases.

For HF, initial contact is made on 4125 USB primary, and 6215 secondary. Sustained communications are then handled on 4125 which, in case you haven't already guessed, is a maritime distress channel.

• Larry Nebram, a mate of mine from Daly City, California, USA, and a very keen aero monitor, visited us recently. Larry is a good buddy of Ed Flynn, from San Rafael, California, who is without question the world's No. 1 ACARS monitoring guru!

The last time I saw Ed Flynn was in October 1994 in Atlanta USA, and he had a portable ACARS monitoring station mounted in his hotel room at the Airport Hilton, literally sucking up every bit of ACARS data the air/ground channels 131.55, 130.025, and

129.125 were exchanging between aircraft and ground stations. Ed was printing out the messages on long rolls, as he was totally unhappy with the readout on his Universal M-400 decoder.

Larry Nebram tells me that both he and Ed Flynn have forsaken the Universal M-400 for the British-made Lowe Airmaster data decoder. Larry says that he and Ed have agreed that it is far superior to the M-400, with a much better display, and overall better performance.

If you would like to know the name of your nearest dealer ring the USA on 0011 1 703 938 8105 and they will give you all the information you need to purchase this great piece of monitoring hardware!

• United Airlines is experiencing a bit of a problem with its new livery; the blue and grey color scheme in which all UAL airliners are now being painted. Apparently, air traffic controllers and other pilots are having trouble seeing United aircraft painted in the new colors. There have been certain situations where the aircraft have literally blended into the dull background.

Complaints have included references to poor visibility of United on cloudy days, or in some circumstances during the night. Overseas, several ground crews riding in motor vehicles have even crashed into United airliners painted in the new livery due to the aircraft fuselage 'blending' in to the background too well!

Former United Airlines chairman Stephen Wolf wanted his planes to look 'much more sophisticated', and ordered the redesigned livery. As a result, apparently, Stephen clashed head-on with his top people in the Paint Department of United, who argued the new scheme was going to mean much bigger maintenance costs.

So the whole issue went to the 'people', the customers of United Airlines, who were surveyed, and they overwhelmingly found the new paint scheme both 'safe' and 'elegant'.

At time of writing, one third of the United fleet of 540 airliners has been painted 'safely and elegantly'. Now they all might require a 'touch-up', in the form of a slightly lightened shade of grey, which United executives are now seriously discussing.

I personally believe the United livery with the darker grey is very attractive, and consider it a pity that this smart new image may have to be adjusted. Still, if people keep colliding with their aircraft, my feelings may not really matter all that much...

• *Climb into the Cockpit by Radio*, my new aviation monitoring book, with double the information to my last book, in many more pages, is available from **Airband Communications**, PO Box 16, Georges Hall, NSW 2198. The price is \$22.95 including postage.

'Listening In' '95 magazine is \$8.00 including post.

See you next month 'In Flight'.

Bob Bell takes us aloft with his new aviation monitoring column...

The Dynalink 1414VQE fax/data modem

By Neil Duncan, VK3ND

In times past, 'electronic data communications' referred to some relatively simple things. Sending telegrams via a teletype keyboard or even clanking out Morse Code signals over a line meant a lot for so many people — through these means the world had arrived on the doorstep for many communities.

Things have changed since then. These days, the ability to send vast quantities of data to anywhere in the world via the standard telephone system is an aspect of life all of us take for granted.

The need for efficient computer communications over land-lines and the reliance of modern businesses on the fax machine are facts of life. As more and more homes include computers in their repertoire of essential household appliances, the perceived need for telephone modem connections in the home to the outside world is also skyrocketing. Internet, E-mail and the use of bulletin boards have given an incentive to millions of users around the world to be able to organise their computers to communicate with others.

As technology has improved and computer hardware has become mass-produced, people demand their set-ups to have more and more of everything — speed, power and precision being high on the list. I also note that they want the costs involved to drop. That has been certainly the case with the chase for faster computers (the transition from XT to 286, 386, and 486 to Pentium and so on has been dramatic). Consider what has happened to the modem as you look into this inexpensive marvel on review. 14,400 bits per second plus a fully-automated fax modem plus software is not a bad deal the price being asked.

Setting up
The **Dynalink Hi-speed V32.bis/V32 Fax/Data modem** seems targeted right at the IBM user. To that end, the unit comes complete with cables to plug into the usual DB-25 COM port on the back of your computer and also arrives with software for either the DOS or the Windows environment.

The supplied software is from BitWare or BitCom and emanates from New York. What is more, it installs like a breeze. The whole process is simple — so long as you get the environment just right before you start. To get up and running, here are the necessary ingredients;

- An IBM-compatible 386 or better computer with a few megabytes of memory and some spare megabytes of disk space.
- A free serial port (COM port).
- a phone line unencumbered by extension lines and with a phone which can be plugged into that modular socket on the back of the modem.

If you want to miss some of the nightmares that I had, be sure that the COM port you choose for the modem has no conflicts sitting waiting to raise their ugly heads. Here, I have a mouse fully trained to tie up COM-1 and I also normally have my music synthesiser taking up COM-2. No problem I thought — just swap the plugs over on COM-2 and away I go.

Yes, that worked just fine with the DOS version of the program but meant problems from within Windows. Once I sorted out that mess I had caused and got rid of the things still hanging on to COM-2, I was right. I bet you I am not the only one who has had COM port troubles in their time!

That part is quite straightforward. Now, the phone line plugs into the

modular adaptor (supplied), which in turn goes into one of two sockets on the back of the itty-bitty modem. Had I a phone that plugged into the other socket on the modem, I suspect the next phase of the review would have been a much happier one.

You see, my phone is up in the kitchen and so I ran a temporary extension lead from it (and parallel to it) down to the shack for this test (that lead has the subtle side-benefit of helping me find my way from the rig to the fridge when it is dark). The trouble is that I found that, unless the kitchen phone was plugged in *and off the hook*, the modem complained about having 'no dial tone'.

I refined to utter perfection the necessary technique to get out to the real world. As the modem was about to dial out, the secret was to yell out 'now!' to my son who was up in the kitchen. He would lift the receiver and hope the computer dialled out before the 'what are you doing beeps' came back down the phone line. Good grief...

Using it

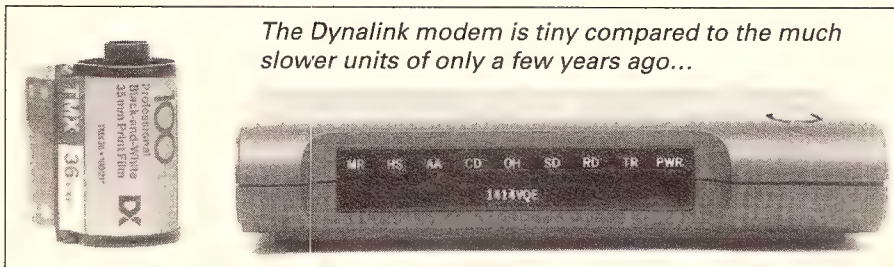
The unit on review here is a 14,400 bit per second modem — and that makes it a very fast modem indeed. In fact, with the clever V42 data compression and error detection schemes built into the tiny modem box, you can generate an effective throughput way in excess of that figure.

To install either the DOS or the Windows versions of the software the simple command **a:install** is all you need.

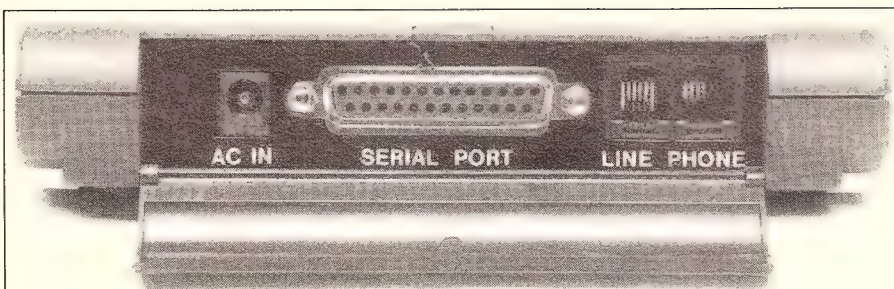
The DOS version of the BitCom software left me a bit cold. It is hardly intuitive in its feel to say the least. To set it up you have to know the Hayes commands quite well.

What is a **Hayes** command then, you say? As an example, to dial out, the command **ATDT 9722 9666** would direct a call to a certain person I know. So how do you learn such commands? One of the **SIX** (count them!) supplied mini-books has the full gen on Hayes commands — but it also ranks as one of the most intimidating books I have yet met.

Another of the books is 'BitCom for DOS', and it also takes a little patience. It assumes you have a broad base of Hayes commands up your sleeve, too. I presume that if you persist and repeat the performance with the third book (for DOS faxes) you could indeed set up the DOS version quite well. I didn't — I gave up.



EQUIPMENT EVALUATION



Here's the rear view. That pretty flap-down door looks good, but we wonder why it's there — connect even one cable and you cannot close it!

In Windows...

In contrast, the Windows version went very smoothly indeed. Essentially, when you run it all, you get a small window that lets you perform the necessary tricks to send data or faxes. The modem routines allow you to create your own home-made telephone books, 'quick dial' lists and an unbelievably comprehensive set of routines of all manner.

In no time I found myself transferring files, pictures and binary gems over the phone line to the house of another person at absolutely blinding speeds. So much for 1200 bps modems and so much for amateur radio packet transfers! *This* is the way to go!...

The FAX modem is similarly spectacular. There are so many ways you can configure it. Transmitting a pre-prepared item is simple enough. You can transmit such things or receive them as files with consummate ease. The part I like most is what I will call the 'print method'. Here, you work on any Windows application — such as a word processor or draw package — and then tell the application to print. If, instead of printing the printer, you print to the Bitware package, the fax software comes alive. It offers you the 'phonebook' or other selections of phone number entering techniques. Then you are away!

There are all manner of automated sending methods and for setting up the all-important front pages or headers. There is also a set of ideas for arranging unattended modes — but I think this will be sufficient description for our purposes here.

The quality of reception and transmission is just fabulous. When I printed some of the received faxes to my laser printer, the result might well have been generated in my own computer. However, I couldn't find a 'fine' mode option on the modem nor could I find any evidence of a voice mailbox option in the modem itself.

Overall

This is an amazing little device and the Windows software that goes with it is just terrific. Some people will relish the use of a fax machine inside their PC, but the philosophy of doing it will vary between users. Sending out letters or order forms in the world of business takes on a new dimension when you can 'just print' and it has gone. Of course, there will be others who may prefer a more conventional stand-alone fax machine arrangement.

The automated manner the Windows software operates and the smoothness of data transmission on both fax and on data modes is, I must say, singularly impressive with the Dynalink external modem I have just tested.

The five 'free' hours of Internet access that comes in the box wasn't tried out, I must point out. It hardly seemed fair to gobble up that as some sort of 'reviewing freebie' so I didn't. Internet is singularity terrific so I would consider this feature a real bonus.

I must admit that I have spent quite a lot of time using the Internet in the past few years. As a school teacher, the Internet can be an invaluable resource, and the students at my school have certainly used it a lot. A fast modem like this one is perfect for Internet...

You may like to check up about COM ports and about the optimum wiring of your existing phone to use with this device. I wish I had done that before I ran the tests. I also wish an overriding manual were present. Much time is spent sifting through the six manuals and little cards trying to figure out where to start.

Need a high speed, external fax/data modem? Despite some teething problems, one will prove hard to beat at the price. It is also one of the smallest units I have met.

The review unit was kindly supplied by Rod Irving Electronics.

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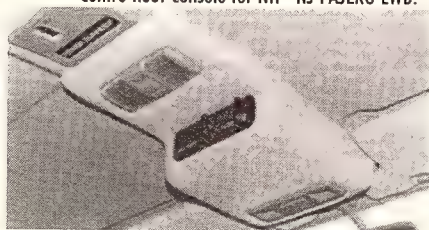
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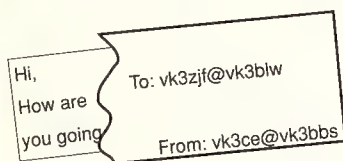
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Last month we discussed the concepts associated with message switching and circuit switching. With message switching we move a complete message in its entirety, and with circuit switching we establish a circuit between two users which is theirs to use until they are finished.

Packet switching

The concept of packet switching was developed in order to provide better utilisation of infrastructure facilities and to permit multiple users to share a single circuit — at least in some parts of the system, if not in all. If you think of it, when we use a discrete radio channel we use only a small portion of the actual capacity of the channel. Thus we are being very wasteful!

Packet switching breaks each message up into a number of smaller units, each one being self-contained, and moves these little parcels, or packets, around the network. Each packet is like a letter — the 'envelope' must have an 'address' for the recipient and a return address for the sender. This makes up the 'header' of a data packet — wrapped inside this 'envelope' is the message itself, or at least a part of it. To this message section we add a 'checksum' which allows the receiver to check that the data received is an error-free copy of what was actually sent.



In Figure 1, above, we can see the basic features of a packet. We have a container, the envelope, which carries the destination and source addresses and inside it we find the message we wish to convey.

All packet systems are based on this concept, but the detail of exactly how they work varies. In Figure 2 (below) we see the basic construction of a packet of data. We have the **To:** or destination address, the **From:** or source address, some control or command information and the data itself. Finally, and possibly most importantly, we have the error protection information which allows us to ensure that the data we receive is intact and not damaged or corrupted.

Packet standards

Every system of communication needs some form of standards, so

that each party to the conversation knows what the other party or parties expects and how every part of the communication is to be interpreted.

In everyday speech we need to know what language we are using. Once we know that, the standards of meaning and grammar are established and, with any luck, we can communicate in such a way as to convey the meaning of what it is we have to say.

The same situation occurs in communication between computers — we need to have standard which is agreed upon by everybody which establishes the protocol arrangements which will be used in the transfer of the data.

AX.25 protocol

In the case of amateur packet radio the basic protocol we use is known as **AX.25**. The **X.25** protocol is the basis of packet switching in the telecommunications world and **AX.25** is the 'Amateur Radio' derivative of it. In fact, some of the people who worked on developing X.25 also worked on developing AX.25 for the then fledgling amateur packet radio community in the early 1980s.

Interestingly, we never call the quantum of data in a packet system a packet! In the case of AX.25 it is known as a **frame**. The AX.25 standard specifies two types of frames, control and data. The basic frames look like those shown below in Figure 3.

Field	FLAG	ADDRESS	CONTROL	PID	FCS	FLAG
Length	8 bits	112-560 bits	8 bits	8 bits	16 bits	8 bits
Contents	01111110	Call signs (with SSID) of Destination, Source & optional Digipeaters	Frame type	Layer 3 Protocol type	Calculated Checksum	01111110

Field	FLAG	ADDRESS	CONTROL	PID	Information	FCS	FLAG
Length	8 bits	112-560 bits	8 bits	8 bits	<256x8 bits	16 bits	8 bits
Contents	01111110	Call signs (with SSID) of Destination, Source & optional Digipeaters	Frame type	Layer 3 Protocol type	User Data	Calculated Checksum	01111110

The bounds, or start and end, of each frame are defined by the flag sequence, a group of eight bits made up of a zero, followed by 6 ones and another zero. This sequence of 6 one bits is not found anywhere else in a frame. If a sequence of 5 ones occurs then the next bit is forced to zero. This technique is known as 'bit-stuffing' and is employed in a great many protocols, not just AX.25. When a receiving system sees a sequence of five 1s followed by a 0, it knows that the 0 needs to be discarded to return the information to what it was before the bit stuffing process was carried out.

Addresses

The address portion of the frame carries the details of the source and destination addresses, and also the identity of the digipeaters to be used in routing the packet to its destination. Digipeating is a concept unique to amateur packet radio and was included in the AX.25 specification to

allow for the movement of frames through repeaters while no higher level protocol existed to support that operation in a more efficient manner.

Obviously the 'address' we are referring to is related to the amateur station's call sign. But one thing which does confuse many amateurs is known as the **SSID**, or **Subsidiary Station Identifier**. My amateur callsign is VK3ZJF. But within the packet system it is often necessary for me to have several alternate identities. For this purpose the designers of AX.25 implemented the SSID scheme. It is assumed that my callsign, as it is, has an SSID of zero and would look like this: VK3ZJF-0, when interpreted according to the rules of AX.25. It is possible for the SSID to take on values between 0 and 15, thus I have 16 possible alternate identities, and when interpreted they appear like this: VK3ZJF-1 ... VK3ZJF-15.

Sadly the amateur callsign system is not a very efficient one for computer networking. But it is a regulatory requirement that all amateurs use their callsign as the basis of their identification.

Digipeating

A 'digipeater' is a packet station set to monitor everything happening on a channel. When it sees its own identity in a frame it receives, it waits until the channel is clear and then re-transmits the frame. The frame can then be repeated by the next digipeater in line, or received by the destination station. Each digipeater sets one bit in the address section of the frame to indicate that 'this has been repeated by me'.

Digipeating, for those who like detail, is a form of routing mechanism known as **explicit source routing**. Routing in a packet system is normally done by things known, obviously enough, as 'routers'. Routers look at the destination address and determine the best way to get the frame to the destination. In the case of source routing, the source of the frame determines how it will be routed. An explicit source route is one where the path is shown explicitly in the routing information inserted before the frame leaves the source.

Control functions

Each protocol has a need for a number of housekeeping functions. In the case of AX.25 we need to establish the communications between the two stations, we need to know what is happening. (Have things been received correctly and if we haven't seen anything for a while has one of you gone to sleep or are you just typing slowly?) These housekeeping functions are handled by a variety of control frames, each of which has a specific purpose and is usually part of a two-way dialogue between the source and destination systems.

We'll look more closely at these protocols next issue, and examine the way they inter-relate. See you then...

To address	From address	Commands	Data - max 256 bytes	Error protection
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Online 1995

Yep, the good ole ONLINE column is back here in the brand new **RADIO and COMMUNICATIONS** magazine format, catering for all your computer and radio needs and wishes! As our Editor has previously pointed out, the wide, wide world of communications is fast becoming a single inter-related whole, and it's certain that computers are destined to remain an integral part of the future of radio. In upcoming issues of **R&C** I hope to bring you news of the latest in radio-related computer software, plus odd bits of info about computer communications that should help with your radio hobby.

Let's plunge right into the topic, then, with a look at some new computer software, which is very much in the tradition of the comprehensive SWLOGIT database program from Canada, mentioned in recent issues of the old CBA.

RADIODESK DATABASE PROGRAM:

RADIODESK version 1.1 (available in compressed format as RDK111.ZIP) is a German-made shareware multiple database MS-DOS program for shortwave radio listeners, amateur radio operators and, in fact, nearly all kinds of radio enthusiasts. Author Ralph writes, "Now the mess of paperwork and logbooks on your desktop should finally stop!"

With **RADIODESK** you can indeed easily file your logbook and QSL card collection. You're also able to record addresses of broadcasting stations and are allowed to use a standardised reception report form in five different languages. **RADIODESK** additionally offers many practical help screens of things you may need to know instantly (amateur radio operator Q-codes, 1910 to 1995 sunspot charts, DX conditions guide, complete country prefixes, the CW alphabet, the international amateur spelling alphabet, RST and SINPO codes for reports, and an outline of the shortwave bandplan). Finally, a glossary of technical radio terms rounds up the complete package of useful tools, all available conveniently via a keystroke or a mouse click from the main menu.

RADIODESK requires a MS-DOS IBM-compatible computer with EGA/VGA video, but a mouse is optional. It should work okay, if a bit slowly, with older XT's and AT's, if you have ample hard disk space. It's not crippled in any way (except for the usual annoying but understandable 'please register' screens) and the registration fee for the 'full-featured' version is only US\$20. Registration details and full operating instructions are, as is usual with all good shareware these

days, included in the documentation that comes with the compressed file.

Sending off the registration fee will bring you from Germany:

- full version with no shareware-screens;
- an updated data file with the addresses of 100 broadcasting stations from all over the world;
- all print forms for your reception reports individualised with your personal data;
- the shareware-line on reception forms is deleted;
- electronic support from the author via the Internet and Fidonet; and
- info on all future updates and other radio software.

So how does **RADIODESK** compare with the much-heralded **SWLOGIT**? Well, it's missing a few of the Canadian program's big features — most notably the world map function and the ionospheric propagation predictor — but it appears that **RADIODESK**'s databases are a bit better and easier to use.

Overall, I'd say **SWLOGIT** still has the edge, but **RADIODESK**'s author is likely to come up with an updated version soon, so who knows where this package is heading? Such is the strength of the shareware, try-before-you-buy system... Take it for a spin yourself and see what you think. (**SWLOGIT** is out in a new version, by the way, up to v1.21, and I'll have a look at this in the next issue of **R&C**.)

STS ORBIT PLUS

Satellite tracking program update

Calling all satellite tracking and communications enthusiasts! The latest **STS ORBIT PLUS** has just hit our sunny shores, and is available in two compressed parts, **SOP9517A.ZIP** and **SOP9517B.ZIP**, on your favorite neighborhood BBS. This is a major upgrade by US author David Ranson, Jr, adding several important new features and enhancements to an ever-popular program that simulates that famous NASA wall-map used for tracking the real Space Shuttle. Being shareware, worldwide user feedback and requests have been a key factor in the author's choice of those features to add.

Among the new additions are: Visible Pass Predictions, Launch Simulation for the Space Shuttle, and new sun and satellite icons.

The Visible Pass Predictions facility allows users to see at a glance when potential satellite viewing opportunities are in the offing. Visibility conditions are

tested at AOS, MAX altitude, and LOS. This new feature is automatic with line-of-sight Pass Predictions. Author Ranson notes that this has been one of the most frequently-requested enhancements to **STS ORBIT PLUS**.

He has also changed the displayed date format in Pass Predictions from "04/24/1995" to "24 APR 95" to avoid confusion between US and Australian date formats, and to allow two extra columns for the "V" (visibility) flag.

The new Launch Simulation feature (for Space Shuttle launches only, and not for other satellites) is enabled when entering launch time and date using the F5 key from the Main Menu. A nice touch and lots of fun for all you Shuttle comms enthusiasts who'd like to run your own little NASA program from home!

The latest **SOP** release also corrects the map coordinates for Cape Canaveral (from several miles offshore to onshore!) and has added coordinates for Launch Pads 39A and 39B at Cape Canaveral. Also by popular request, Ranson has increased the maximum number of tracking stations permitted from 25 to 50. Finally, **SOP** users may now select as the user location any of the tracking stations in the tracking station file direct from the program's main menu.

STS ORBIT PLUS remains great entertainment, folks, whether or not you listen to satellite communications, and is extremely easy to set up. New satellite element files for **SOP** and other satellite tracking software are available regularly from **SATCOMM BBS** in Sydney and **TBSA BBS** in Melbourne.

Latest scoop on Australasian radio-related computer bulletin boards

Now here's a more comprehensive than usual round-up of the Australian and NZ computer bulletin board scene, featuring those dial-up systems that specialise in radio-related information.

TBSA Radio BBS (Talkback Services Australia) is online 24 hours daily in Melbourne on (03) 9455 1309 and sysop Michael especially caters for amateur radio and packet enthusiasts.

The Fox's Lair BBS, mentioned above and also catering for the ham crowd, is reachable on (03) 9888 7741 down Yarra River way, under the supervision of sysop Andrew McColm.

Also in Melbourne, **The Radio Shack BBS** offers a wide range of radio info, for amateur operators, SWLs, medium wave DXers and scanner enthusiasts, hosted by Simon Kay and Dave Onley. Ring (03) 9532 5737 24-hours daily.

Patrick Mc Donald looks at what communication-type software is available on the Bulletin Boards...

In Sydney, Chris Keladis' **The Twilight Zone** carries radio software on (02) 750 6117 and Paul Britton's well-organised **Satcom Australia BBS** on (02) 905 0849 is the place to ring for all your satellite DXing software requirements and the latest satellite elements for tracking programs.

Finally, the evergreen Big Smoke-based **Shortwave Possums BBS** is still doing just fine, thank you, on (02) 651 3055.

Not living in either Sydney or Melbourne? Or perhaps you've enjoying life under the Long White Cloud? Hmm... what a shame!

But hang on, here's a list of computer bulletin board systems to try that might help you with your particular niche of the radio hobby.

Though not catering especially for radio enthusiasts, they nevertheless carry a certain amount of software that may be of interest and at least some of the radio-related echomail message conferences. And remember, if you ask your local neighborhood sysop politely about radio files and message areas, he/she may be willing to enlarge the system's collection!

New Zealand:

TV MANIA BBS in Christchurch 0011 64 3 352 8586

SunCity BBS in Nelson 0011 64 3 548 9171

Queensland:

Power Up Information Exchange BBS in Brisbane (07) 399 1322

The G-FORCE! BBS

in Redlands (07) 245 1177

The Redcliffe Library BBS

in Redcliffe (07) 283 0315

THE BAUDer LINE BBS

in Toowoomba (076) 91 6258

Far Northern News BBS

in Cairns (070) 33 1553

South Australia:

Computer Connection BBS

in Morphett Vale (08) 326 2388

Oracle PC-Network

in Flinders Park (08) 234 0791

Sawasdi BBS

in Hampstead Gardens (08) 261 7802

Tan80 BBS

in Morphett Vale (08) 326 1132

HOT-LINE BBS

in Goodwood (08) 373 5136

ACT: The InterACTIVE BBS

in Canberra (06) 239 7311

Western Australia: The Perth Omen in Innaloo (09) 244 2111

Multiline BBS

in Mount Lawley (09) 370 3333

West Gate BBS

in Mirrabooka (09) 270-1471

NT: Opus Theta BBS

in Darwin (089) 87-3171

Now, continuing with our ongoing project of bringing our readers more detailed information on the various computer bulletin boards around Australia that cater for the radio crowd, here's a little peek at Andrew McCole's **THE FOX's LAIR BBS** in Burwood, Victoria, with FIDONET address 3:635/543 and a 24-hours phone number of (03) 9888 7741.

Technical details first, says sysop Andrew:

The system runs on a 386 IBM-compatible PC with 800Mb of hard drive space and CD-ROM capability. The BBS's modem accepts speeds from 14,400 bps down to 1200. New users as well as regular users get 30 minutes of online time per day.

THE FOX's LAIR BBS sees its target group as amateur radio operators, especially those who are interested in 'fox-hunting' or radio direction finding.

The sysop carries the local Victorian competition scores and placings, including ladders and project files for RDF equipment.

Naturally, the major radio and general electronics file and message areas are also available, so THE LAIR actually caters to quite a wide cross-section of the amateur radio and electronics community. Andrew is himself a keen 'foxhunter', of course, seeing in local competitions a social event as well as a good night to get out and test his latest RDF creations.

"Most foxhunting material is home-made," he reports, "and can be as simple as a few tuned circuits or as elaborate as microprocessor-controlled sniffers or Doppler systems."

When not able to escape from the house to compete with his foxhunting mates, he listens in the shack on VHF and UHF to the local foxhunting chat frequencies.

For a day job, sysop Andrew is involved in the television industry and also works for himself when time permits.

He assists in putting together such great shows as 'Healthy, Wealthy and Wise' and also writes various kinds of corporate software.

Though living on a quarter-acre block in the suburbs, he says that he manages to keep "...a german shepherd and a moggy... and by the time you read this there'll probably be the pitter patter of another two pairs of feet on the polished floor boards, another shepherd pup...".

Keep up the good work, Andrew. And no fair using the German Shepherd to find those foxes!

Gee, looks like it's already time to close this column. We must have been having fun! Remember, please, that your feedback is always appreciated. Suggest to me what topics you'd like to see covered in the radio/computer field and tell me about your favorite software or radio related BBSs.

Best is electronic mail to patrick@mpx.com.au, but FIDONET netmail to **3:713/605** is good too. Australia Post snail mail is read and appreciated, too, if sent to the address inside this mag's front cover.

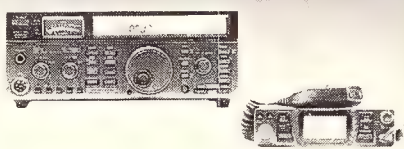
And that's a wrap, folks... see you next month!

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For those who like to read about new and unusual products for the radio amateur, here is a little something to *really* raise the eyebrows. For those with a real space problem with respect to antennas (such as apartment or crowded inner-suburban dwellers), find a comfortable chair and prepare to read about your new DX antenna for the bands from 10 to 30 MHz.

Let's assume you have a 100 watt transceiver and a penchant for operating the 'DX bands'. Your problem is that despite all manner of thought experiment and appropriate pleading with your neighbors, you cannot figure out how to put *any* antenna up, given the constraints upon you. For a start, a beam is out of the question if you are in a caravan park or in a block of flats. A vertical antenna may well be awkward or conspicuous, and a random length of wire would be spotted by the TV addicts for sure.

No, something more subtle is required. How about this one then — a high-Q loop about a metre in diameter with a motorised capacitor in the middle. Press a button in the shack and this antenna-mounted antenna tuner/antenna brings the whole thing to resonance for you. You then mount the MFJ-1786 horizontally inside or on the roof or perhaps above the caravan or in a variety of subtle places like up a tree or in some obscure nook or cranny and off you go.

Those with a little more adventure in their soul may mount this UFO-like thing in a vertical plane and use a rotator to point it in the right direction, thus giving them the capability of nulling out the QRN or QRM that is often a problem at their place. In this mode, the expense of the device may become a worry though. Who knows, it may still be worth it — just to be able to 'get out' on the bands!

What is it?

The people at MFJ have managed to arc-weld some large diameter (1.25 inches, whatever that is in kilometres) aluminium pipe into a loop about one metre in diameter. A large, ugly plastic box arrangement encloses a high current variable capacitor and a motor in the center of the loop. Voltage and data is fed up the coaxial cable to the motor along with the RF signals. That is, no other wires are necessary other than the coax-cable — although this arrangement precludes the use of other things such as antenna switches unless you are careful.

HIDING YOUR DX ANTENNA... THE MFJ-1786 10-30 MHz LOOP

The result is a military-like antenna which seems indestructible. While I can spot some holes and gaps in the plastic 'dumbbell' arrangement, there is a purpose for everything. The holes let the water out rather than in, and are meant to be like that. Installation is easy. You find a suitable piece of pipe and clamp the loop antenna to it. Please note that the tripod you see in the photograph is *not* supplied with the MFJ-1786. Some users will have no choice about how they mount the antenna, but if it is to be mounted within about six metres of a metal roof, it should be in a vertical plane. Apart from that case, you make your choice freely. Remember, though, that a rotator will be needed if it is vertical.

A single length of 50 ohm coaxial cable was taken from the review antenna and run into the shack. It is at that point that the second aspect of the MFJ-1786 becomes obvious. For your money, you also get a black box whose function is akin to an antenna tuner. It contains a cross-needle SWR bridge and all of the necessary goodies you need to get it all on the air — except for a power supply and a coax run from the box to the rig. You will need a source of 9 to 15 volts with one special rule applying: the negative lead of this voltage source *must not* be grounded. That will get a few frowns I imagine.

With a very high Q antenna, there are some compromises to expect. The first is that a move of even a few kHz will require a re-tune of the antenna. I will return to that point. The second is that the thing can generate some pretty mean currents and voltages up there. If you transmit with the maximum power allowed (100 watts), there is sufficient

current in the thing (on odd occasions) to melt wire. That would certainly explain the use of aluminium pipe.

More worrisome though is the effect of high RF voltages that we read about these days. One thought springs to mind here — if I spread some meaty cat food on the thing and sit here with my finger on the PTT switch, I bet I could zap the wretched cat from next door when it is on the prowl. Hmmm...

As with most products emanating from the litigation capital of the world (USA), this one is covered with warnings and stickers. Don't put it near power lines, don't cook people and the like. Okay MFJ, I get the point, but it is almost enough to put you off the thing. The manual is more like a legal document than a helpful, technical dissertation.

On air

The bottom line is this: the MFJ-1786 performs in much the same way as a dipole at the same height when in a horizontal mode, and operates with significant advantage in vertical mode. No, the advantages don't include extra gain over a trapped vertical. Try directionality, the ability to null out offending bits and pieces and a lower level of QRN.

The greatest advantage over a dipole, though, is that you have access to the 10, 14, 18, 24 and 28 MHz bands for amateur radio use from the one piece of coaxial cable, and this is consistent with some real limited space capabilities. In addition, of course you have the complete coverage from 10 to 30 MHz on receive too, including all of the interesting shortwave bands in that range too. For some, this would be a reason for choosing this loop antenna above a vertical. Trapped verticals can be very deaf indeed if you try using them away from the amateur bands...

Here is how you work things. Turn your transceiver on and think of a frequency. Let's try 14.195 MHz. What do we have to do to get the antenna going there? First we press the 'coarse up' or 'coarse down' buttons and listen for the noise emanating from the receiver to go through a highly obvious peak. Next we tweak the 'fine up' or 'fine down' buttons for an exact peak. Done.

If you want to transmit, run some very low power and tweak the fine tune buttons 'til the SWR is at its very lowest — in most cases, the peak-the-noise method will have lobbed you exactly there. It takes mere seconds (although that initial big tune can take up to 30 seconds in the worst case). Now, MFJ

has indeed thought this worst case scenario through. Try this: knowing that you are miles away from your last used frequency, go to transmit with a carrier on your chosen frequency with sufficiently low power not to zap the rig if it sees a very high SWR. If you have pressed the appropriate buttons, the capacitor in the antenna will be run through its range until it passes thorough resonance. At this point, the control box senses a dip and sets off a buzzer (sufficiently loud, I might add, to have the neighbors send for the police, thereby cancelling one of the advantages of the antenna).

At this point, you release the button and fine tune until things are perfect. The system works very well indeed and had me very much on-side after just a few uses. If you change frequency just a little bit, re-peak with the fine tune or dip the SWR on transmit again. It is smooth and easy provided your nerves are not shot (from the buzzer) and that your eyesight is okay. I *just* made it, I hasten to add. I don't think I would try it if I was as full as a boot though.

Value for money?

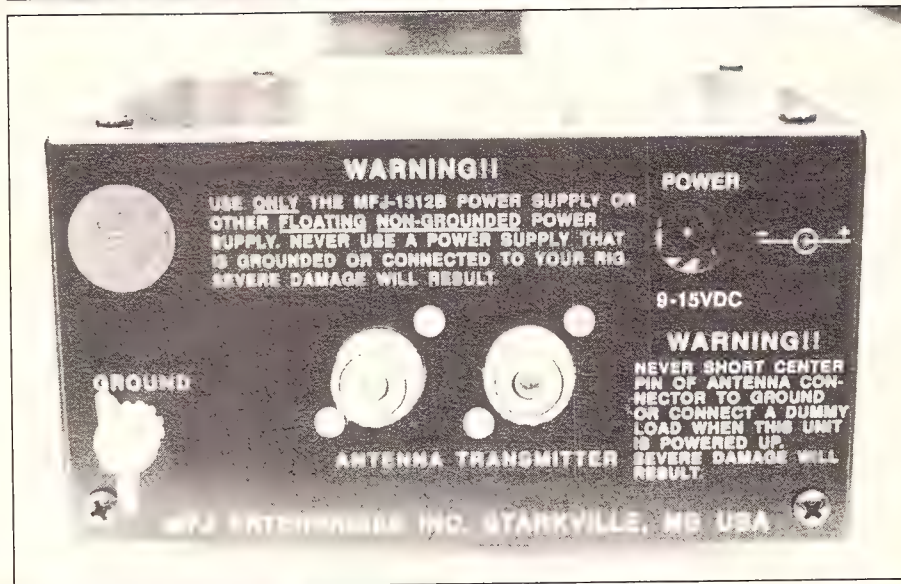
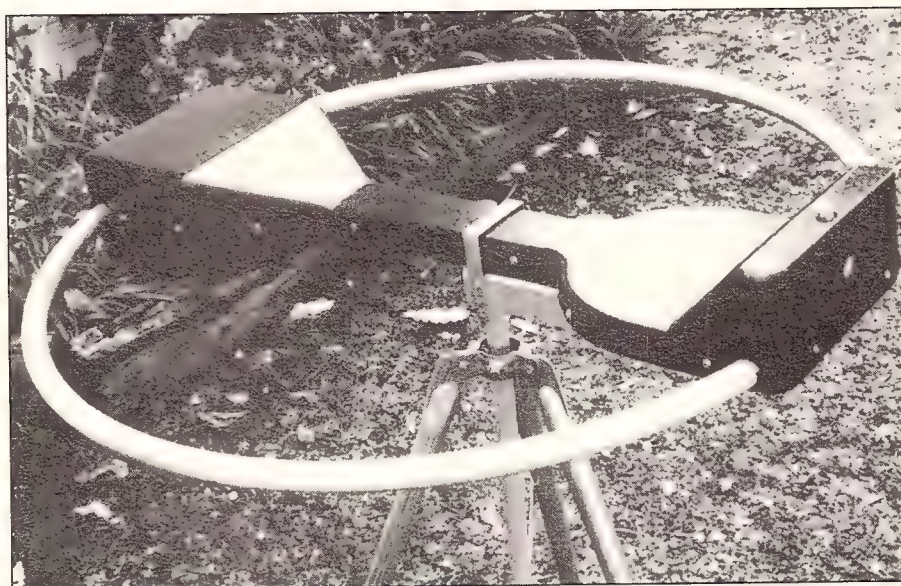
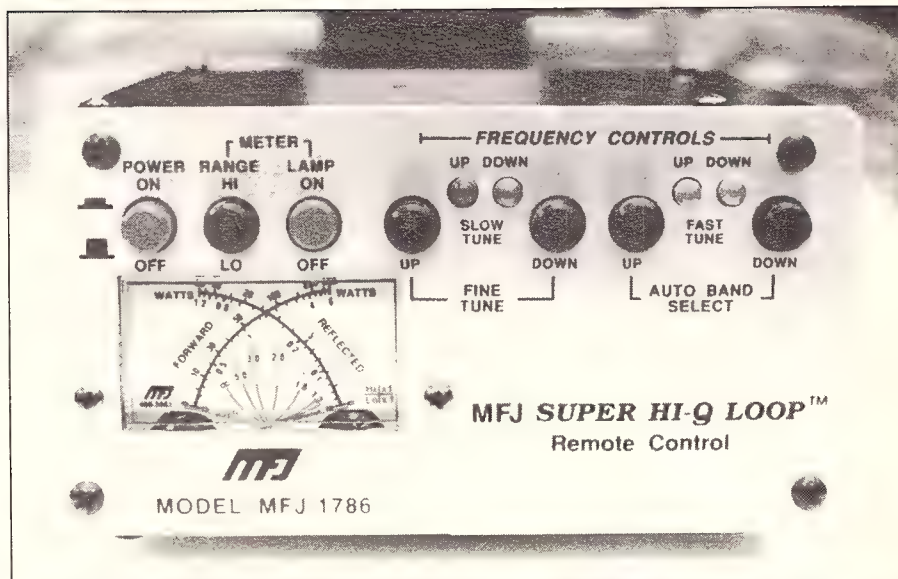
At \$625, this antenna may seem a little expensive to some. Remember though, you are talking about a multi-band antenna with the equivalent of an antenna tuner and SWR bridge thrown in as part of the deal. I cannot argue that the MFJ Super Hi-Q Loop Antenna is better value than a trapped dipole or even a set of dipoles, but for some that is irrelevant.

Just to be able to get on the air is a battle for some. This antenna leads the stakes in 'hide-ability' in my opinion. It is brilliantly portable and can be assembled in mere seconds, making it ideal for portable, emergency or field day uses.

On air, I worked into Europe and into the States on the 100 watt maximum it allows but with some difficulty — remembering that the bands are flat dead these days. The pluses are limited space capability, a nulling ability if you wish, and clear receiver enhancement (in that it places a super-sharp 'passive preselector' in front of the receiver helping with QRM and the like). On the minus side, it is a bit tricky to tune, is quite pricey and generates some dangerous voltages.

MFJ will have a winner for a corner of the market with this one — perhaps it will be a round corner at that, too.

Amateur Radio Action thanks Daycom Communications for the loan of the review antenna.



EQUIPMENT REVIEW...

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WARNING WARNING WARNING

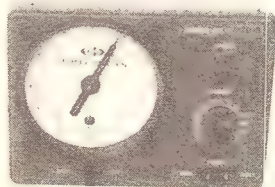
Manufacturers world-wide are ceasing production of VALVES, VACUUM TUBES — whatever you want to call them! JAN/ECG/PHILIPS in the USA have already run their last production of 6146W tubes, with a rugged version especially designed for Collins S-Line and the like.

Shortly, users of some beautiful transceivers like these will have to discard them simply because replacement tubes will no longer be available.

We have good stocks of these last-forever classics: 6146Ws (ruggedised version of the 6146B) for just \$50; matched pair \$115.

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New Matchall fully-automatic coupler. Covers 1.5-30 MHz at 150 watts into any random length of wire. There are no knobs, and it requires no external power at all. This unit is ideal for portable operation using an earth stake and a local farmer's fence. Make sure the fence has wooden poles! This month, including air freight, it's just \$299.

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AEA SWR-121 HF	Include Fragile Freight	\$750
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Late news

ATN Antennas has recently been appointed the sole distributor for Australia & New Zealand for **High-Sierra** remote-controlled, centre-loaded mobile whip antennas.

These antennas cover 3.5 to 30 MHz continuous at 500 watts PEP.

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We are also the sole Australia/New Zealand distributors for **Ramsey Inc.** test equipment and kits. These are similar to the old Heathkit series. We'll have more details for you soon...

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Well, it's taken a while — quite a while, in fact — but our new amateur radio licence conditions were gazetted on Friday, June 2, after a wait of several years since the proposals were formally announced. The SMA has kept R&C fully informed about these developments, and we thank its Canberra head office for supplying the information from which this report has been compiled.

The changes will prove very popular, we feel, with the clearest-ever differentiation between the various grades of qualification. The only down side (if there is one) is that the full call class of licence — representing the majority of Australian amateurs — has not been upgraded as much as other classes of licence — but there is one significant change which we'll deal with later.

The big news, of course, is the new no-code **Novice Limited** licence. Summarising other significant developments we see...

- increased power limits for Novices;
- formal recognition of the former 'Combined' licence holders with the **Intermediate** licence class having unique concessions not available to the Limited or Novice classes;
- access to the Packet Radio mode and the 70cm FM band for Novice and Novice Limited licensees;
- a true HF option for Limited licensees on 10 metres FM.

And now, the details... We'll start with the new grade of licence and work our way up from there:

Novice Limited

This is an entirely new grade of licence. To qualify for this most basic, entry-level grade you need only a pass in Novice-level theory and the regulations exam common to all grades of amateur licence. It is a code-free licence with access to the two metre and 70cm bands. Operators may run up to 30 watts of FM, and they may also use Packet Radio on either band.

The band allocations for the Novice Limited are:

144.692 to 145.208 MHz (for access to the packet network) and 146 to 148 MHz on the two metre band and 433 to 435 MHz and 438 to 440 MHz FM or packet only. Packet radio transmissions are permitted in either band.

Please note that these frequencies *do not agree* with those in an official SMA notice (Information Paper 4A) dated March 30 and released in April this year. It was incorrect; the details in this article are the right ones.

The two allocations in the 70cm range are made to allow access to the 70cm voice repeater network, which uses a 5MHz downward split. Users listen 5MHz above the repeater input frequency. However, while simplex operation in the 433 to 435 MHz range is not in step with the WIA's band plan for the band, it is not illegal to operate there. We would suggest you make sure that you're not operating on the input channel for a local repeater!

Callsigns in the Novice Limited class will have a suffix commencing with the letter 'H'.

It's worthy of note that examination candidates who had already passed the Novice theory and regulations exam are now entitled to apply for one of the new licences and, once the certificate of proficiency and licence have been obtained, they may go to air without further examination.

Novice

The early SMA Information Paper 4A also said that Novices would have access to the entire 15 metre band of 21.0 to 21.45 MHz. This was also incorrect. The new frequency allocations available to Novice operators are as follows: 3.525 to 3.625; 21.125 to 21.3; 28.1 to 28.6; 144.692 to 145.208; 146 to 148; 433 to 435; and 438 to 440 MHz.

In other words, Novices now have access to additional spectrum as detailed above, but are still limited to a partial portion of the 15 metre band only 100 kHz greater than existed before now.

Novices, in common with the Novice Limited category, are now allowed access to packet radio.

Their power limits have been significantly raised to 100 watts pX on HF and 30 watts pY on VHF and UHF.

Intermediate

The Intermediate class of licence is actually freed up quite a bit compared to the former 'Combined' class of licence, which offered all of the privileges of the Limited class plus those of the Novice class of licence. The combined licence was initially offered

Great new amateur licence conditions announced

By Chris Edmondson, VK3CE

To start with, the Intermediate (all three-letter J and K callsign blocks) operator gains access to the entire 80, 15 and 10 metre bands (but NOT the 80 metre DX window), and has gained a very worthwhile increase in power allowed on HF.

On HF, the Intermediate licensee may now run the full legal limit of up to 400 watts pX (on modes such as SSB), and on 10 metres and above when running FM is limited to 120 watts pY.

Now read the Unrestricted section to learn about one extra concession.

Limited

Big news for the no-code Limited licensee is their first-ever access to HF. Australia led the way for the world in 1955 — 40 years ago! — when it introduced the Limited licence. It was the world's first no-code amateur radio operator's licence, and offered exactly the same operator privileges as the Unrestricted licence, but only on bands above 30 MHz.

Now our Limited licensees have access to one HF band, until now the exclusive domain of those who have passed an examination in Morse Code proficiency. Their 10 metre access is strictly limited, though, if you'll excuse the pun. Transmission are restricted to 29 to 29.7 MHz, FM only, with a maximum transmitter power of 120 watts pY — easily enough to work the world given suitable equipment and the right conditions.

Go to it! The main simplex calling channel is 29.6 MHz...

Unrestricted

Many amateurs holding their 'full call' licence would be thinking they've not won a thing with the release of the new licence conditions, but that's not exactly right.

The six metre band, 50 to 54 MHz, has a series of restrictions placed on its use if the operator is in New South Wales, Victoria, Queensland, Tasmania, the ACT or the Jervis Bay Territory. The primary restriction has seen access below 52 MHz limited to 50.12 to 50.2 MHz — enough to catch the international DX and little more.

That band has now been extended to allow operations in the range 50 to 50.3 MHz. The geographical limitations relating to channel Ø television stations and translator sites remains in force.

Power limits for unrestricted operators are unchanged.

The SMA was at pains to point out to us that the licence conditions for repeaters and beacons have not been amended at all, and remain exactly as they were prior to the June 2 announcement. These devices must continue to conform to current licence terms and conditions. A couple of final points were raised in our discussions...

- The **80 metre DX window** remains available, but the SMA warns that it is monitoring operation there very closely indeed, and is still concerned that several operators have breached their licence conditions by working outside the very narrow allocated spectrum there. Make sure you operate only in the allocated space (and the hint is to stay as close to 3800 kHz as possible).

- Many recent dual-band two metre and 70cm transceivers offer a **cross-band repeat** function. It was initially hoped that the use of this function would be authorised when the new regulations came into force. This is not the case, and the function should not be used.

- Packet radio systems often mirror telephone-type bulletin board services, and the temptation must be strong to **interconnect** the two. However, such interconnection remains in clear breach of the new operating conditions and would place an operator's licence in jeopardy.

These are licence conditions to take the amateur service well into the 21st Century. I forecast that a lot of people will rush to get the new Novice Limited licence, then hook up the rig to a TNC. Many won't even bother all that much with the microphone, preferring to shift their attentions from the 'pay-as-you-dial' variety of BBS to the less-expensive packet BBS system.

Just watch the pressure on the packet radio network cause some dramatic rethinking over the new few months...

PK-232 Fixes and Modifications

Noise reduction

This mod is of particular benefit to **AEA PK-232** TNCs prior to about 1990 (that is, before the introduction of the model with the fancy multi-color LEDs). Basically, the operation involves adding by-pass capacitors directly across the power supply pins of all the op-amp filter ICs. This removes much of the power bus noise, produced by other circuits within the TNC, and enables much weaker signals to be decoded than was possible previously with the unit in standard condition.

Here it goes, then:

Remove power from the unit, disconnect and label all cables and take steps to protect the circuit ICs from electrostatic discharge. Remove the top cover by unscrewing all six cover screws, side and rear. Remove the knob on the threshold control along with the nut which fastens the threshold pot to the front cover. Now go ahead and remove the entire PC board by removing all six fastening screws.

With the front of the board facing you, locate chips U-23, U-26, U-28, U-30, U-32 and U-34. In my PK-232 (S/No: 36633) these chips are type MC34074-P, shiny black and marked 'JRC' as opposed to a flat black type on the other ICs on the board. In units with the daughter board installed, all the subject chips are located on the main board. All the subject chips are located on the right hand half of the main board. Turn the board over and mark each chip with a felt tip pen as you locate it. While you are there, identify and mark pins 4 and 11 of

each chip; these are adjacent to one another.

Now, with the PC board positioned track side up, carefully install a by-pass capacitor across pins 4 and 11. With all chips pin 11, toward the rear of the board, is the minus side. Pin 4, toward the front of the board, is the plus side.

Preferably the bypass should consist of a ceramic capacitor of 0.1 μ F 25v or higher, and an electrolytic of around 1.0 μ F 25v or higher should be paralleled across the pins. The two different types of capacitors act to provide alternate paths and avoid strange resonances that can occur when only one unit is used, providing more effective bypassing action. A considerable amount of dexterity and attention to detail is required to place the dual capacitors.

The most effective capacitors for this job are ceramic types, as tantalums are not as effective. Once you have completed all ICs mentioned above, check for shorts to neighboring pins, then reassemble the unit and fire it up. You will find an amazing enhancement of weak signal resolving compared to pre-mod condition.

Problem: On older PK-232s, TTL level transmit data is present on the FSKN and FSKR pins on J7 of the TNC regardless of the position of the RADIO 1/RADIO 2 switch. When left connected to the direct FSK keying inputs of many HF transceivers, the data on these lines causes noise on the HF transmitted signal on other modes (SSB and FM particularly) when the other port is being used on another radio. Also, to use direct FSK keying, one must split the interconnect cable (if you still use it) at the PK-232 end because the receive audio and transmit FSKN/R signals use

different connectors on the unit.

Solution: Select either the FSKN or FSKR signal (whichever you use) and substitute it for the SQUELCH input on J4 and J6. This allows the TTL level transmit data to appear on J4 and J6 pin 3 as selected by the RADIO 1/RADIO 2 switch. This eliminates both of the above problems. As a bonus this mod requires no trace cuts, drills or similar destruction, and may be easily restored.

Here is how it is done:

Select the appropriate signal for your application. Remove R150. Ground the base of Q6 using a jumper to the pad left by the Q6 side of R150. Connect a jumper between the pad on the SW2 side of R150 and U-38 pin 2 or pin 8 depending on your choice of signals. Note that the pinouts on J7 for FSKN and FSKR are reversed at U-38 on some PK-232 schematics. FSKN thus appears on U-38 pin 8 and FSKR on U-38 pin 2. The labels on J7 are correct.

Mods for early PK-232s

These mods are useful to correct problems with PK-232s with serial numbers under 1000, and since the PKs are such good workhorses, many of these should still be around and going strong.

Change C54 from 0.1 μ F 10% Mylar to 0.01 μ F 10% Mylar. This increases low-frequency rolloff.

Change U-16 from 74LS04 to 74HC14. Do this only if the PK-232 loses parameters.

Change R35 from 20Kohm 5% to 39Kohm 5%. This improves VHF/Morse sensitivity.

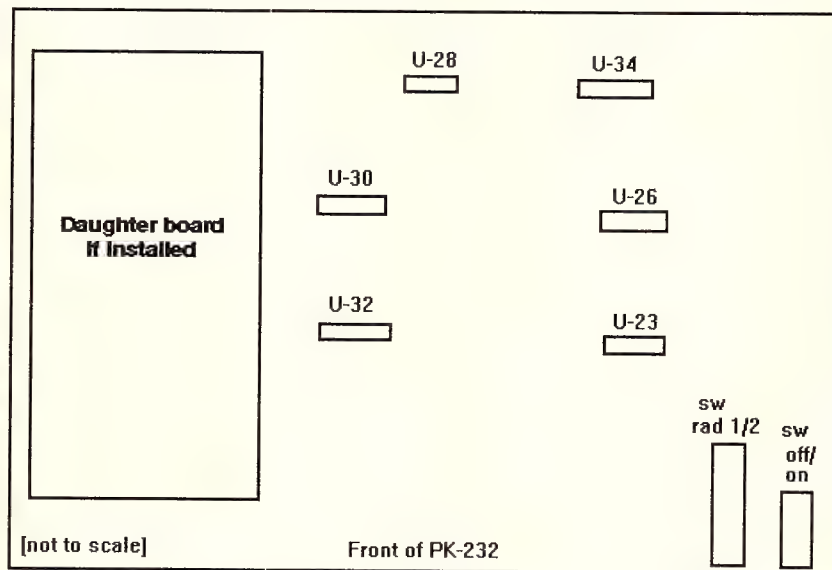
Change 0.047 μ F 10% Mylar in series with R79. This also improves VHF and Morse sensitivity.

Kenwood modifications

Increase power output on Kenwood TS-50

If you are the proud owner of a recent **Kenwood TS-50**, and would like to drag about 100 more watts out, then this mod will be of interest to you. The modification is very simple and does not require any soldering. Some operators that I know have modded their radios to run at over 200 watts peak, even with long, drawn-out overs, and have had no problems. However, it would be advisable not to run 100 per cent duty cycle modes like FM for long periods at full power. Maybe you would want to run it at a lower power setting...

Place the radio before you, with the front facing you. Remove the top cover of the radio. Attach a power meter, a dummy load and a power supply that can deliver at least 20 Amps. If the



MUDMAP OF PK232 INTERNALS

power supply can't deliver enough current, the radio will shut down upon keying.

Locate the small vertically-positioned board near the beginning of the heat sink. Note, it's the only board that is mounted vertically near the rear of the radio. There are two small potentiometers mounted on this vertical board. The right pot is the ALC adjustment and the left pot is supposed to be the SWR shut-down



don't play with them unless you know what you are doing.

Behind the vertical board and somewhat to the left of this board is a small white potentiometer. This is the potentiometer that will set your output power. Set the TS-50 to FM mode and key it up into the dummy load. Now turn the white potentiometer BEHIND the vertical board carefully clockwise and watch your power meter go up. Set it to the power level you want.

Remember, there is little noticeable difference at the receiving end between 200 and 250 watts, but there is a noticeable difference between 100 watts and 200 watts. At the very least, the increase may mean the difference between no contact and a noisy contact made and confirmed. After the adjustment is carried out, the low and medium power settings change. You may want to throw a power meter onto the radio and confirm actual power outputs after this mod on high, medium and low settings. Have fun.

TS-520 CW/SSB filter select mod

CW enthusiasts who own TS-520s would have found that when copying weak CW signals, the 500 Hz filter does make things rather difficult. Switching that filter out when copying that tiny signal would enable easier copy. In the TS-520SE, the heater switch has been replaced with a CW wide/narrow select switch. For owners of older TS-520s here are a couple of methods of switching the filter out when required.

A miniature SPDT switch may be installed at the owners preference, on the rear or bottom panel. This is done by wiring the brown lead, which normally is transferred to the CW terminal on the IF unit, between the SSB filter for WIDE and CW for NARROW filter operation.

The more usual method is to use the FIX CH switch, since few operators have crystals installed in these slots. Use position 3 for WIDE and position 4 for NARROW for filter switching. This can be done by completely rewiring the switch, or by leaving the switch wiring and the filter wiring as for

normal operation and bridging FIX CH 3 terminal to IF SSB terminal, and FIX CH 4 terminal to IF CW terminal. Placing the FIX CH switch to position 3 will then operate the SSB filter in the CW mode. Handy.

Icom modifications

The IC-745 32 memory mod

To carry out this mod, it will be easier to follow if you have available the Components Layout Sheet and schematic that came with your Icom IC-745. You will be soldering wires directly to component leads, therefore, you will need a high quality temperature controlled soldering iron. You have been warned.

The IC-745 was the first transceiver equipped with the EX-314 memory module using logic circuitry that is similar to Icom's IC-R71 receiver (the IC-R71 has 32 memories where the IC-745 only has 16). The 16 memories are selected using a 4-bit binary rotary switch that's connected to DB0, DB1, DB2, DB3 and Y5. The 16 switch positions generate a count from 0 to F hex and is read by the microprocessor on the logic board.

The IC-R71 receiver selects 32 memories using two 4-bit up/down counter ICs that are connected to the same data bus (5 bits from the two counters generate a count from 0 to 1F hex). On the IC-R71 the fifth bit is connected to DB4.

The IC-745 32 memory modification requires the installation of a one switch and one diode. I suggest that you use the front panel PREAMP switch because it's close to the Matrix board. (If the wires that connect to the Logic board are too long, they can radiate digital noise and interfere with the receiver.)

The switch will be used to select a second bank of memories by addressing the fifth bit (similar to the fifth bit in the IC-R71 counters). The bank switch instructs the microprocessor to read new locations in the RAM memory. You can always add a rear-mounted switch to control the pre-amp if you really need to be able to switch it in and out.

Disconnect the antenna and the power to the radio. Perform the work in a static-free work space. You can also protect the radio by grounding it to a water pipe or a ground rod. Connect a jumper lead to ground with a 100k resistor in series and, while doing the modifications, connect the other end of the clip lead to a metal watch band.

Remove the radio's top and bottom covers and place it upside-down on a your work table. Remove the ribbon connectors that run from the Logic board (on the main chassis) to the Matrix board on the radio's front panel. The ribbon connectors are very delicate, so be careful when you unplug them. Remove the four front panel mounting screws (they are located on the left and right side of the chassis).

Disconnect the existing wires that go to the PREAMP switch and reconnect them to an external or rear-mounted toggle switch (the existing wires connect to a relay that switches the pre-amp in and out). These wires connect to the coil of the pre-amp relay so wire length is unimportant. Connect the cathode end of a 1N914 (or equivalent) diode to J13 pin 2. Connect the anode side of the 1N914 diode to the switch. Connect the other side of the switch to J12 pin 5 or W13 on the Matrix board.

Now that the modification is complete you can remount the front panel and re-connect ribbon connectors. Mount the top cover. Make a final check to ensure you have not left any tools or whatever still inside the radio (don't laugh, I know of a few people whose radios rattled from new... until we opened them up and retrieved 'bits' from them.) Connect the radio to a power source and hook up the antenna. Turn on the radio. It should operate normally, given the complete absence of Murphy.

When you first power the radio, using the pre-amp switch, you can access a new bank of 16 memories. Firstly, however you will have to store new frequencies in those extra channels. Press the preamp switch and lock it in the down position. Place the radio in the VFO mode and store any frequencies starting with the first memory and continuing up. Place the radio in memory mode and rotate the memory switch. The frequencies that you stored should reappear. Press the pre-amp switch and unlock it in the up position. The old set of frequencies (that you stored before you made the mod) should appear. When you have entered frequencies into all 32 memories, the radio will scan all 32. All other functions should operate normally. One more successful mod all over.

See you next month with more handy tips.

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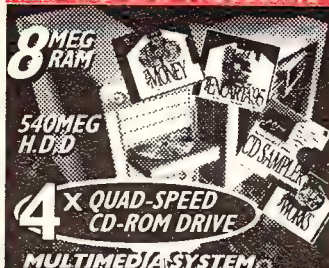
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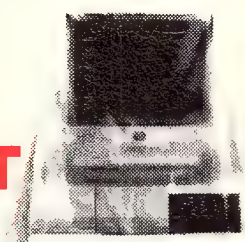
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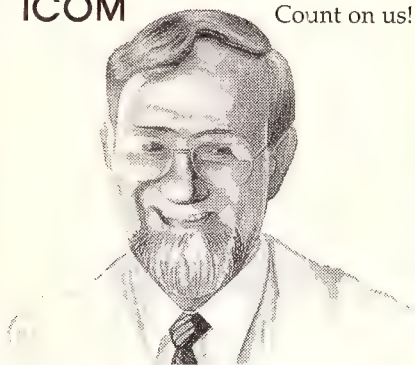


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ANTENNA EVALUATION

The Oztennas Longreach two metre antenna

By Neil Duncan, VK3ND

I am a lucky person when it comes to installing antennas at my outer suburban block. My QTH is sufficiently far from any salt water that corrosion is never a problem, there is no snow and ice to make elements sag and break, and the neighbors, bless them, trust me when I tell them that nothing from 'up there' will land in their yard, damage their roof or spear into the kids.

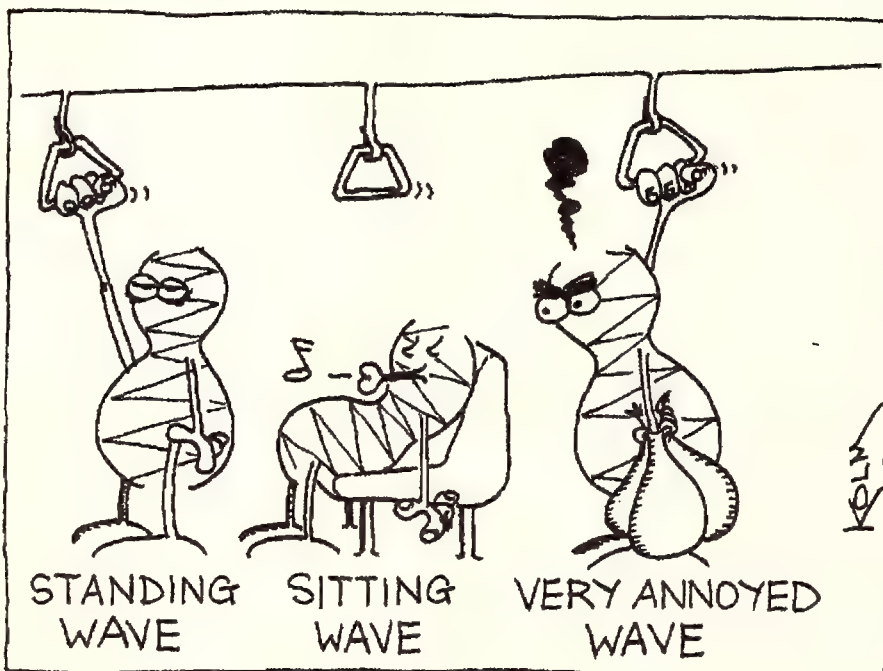
There are those among us, however, who require a little more than I do when it comes to hardware to be mounted up the tower. What sort of antenna would *you* install for two metre use on top, say, of the tower at the summit of Mt Hotham or in the front yard of a coastal house where roaring gales and lashings of salt water are the go?

In either scenario, there are things to avoid — thin aluminium tube, joints relying on clamps using dissimilar metals, exposed electrical connections, pop rivets and joints where meagre spikes or simple clamps are used. That kind of rules out a whole heap of antennas, doesn't it!

What we have here is an antenna designed by an engineer and manufactured to wear all manner of stresses and evil conditions. The Oztennas **Longreach two metre antenna** is a simple groundplane (albeit with only three groundplane elements) designed for two metre operation and is built like a tank (I mean no offence to Volvo drivers).

Looking something like Sputnik II, this antenna is a delight to behold with its sculptured main body sporting a SO-239 at one end and the radiating element at the other. The insulator at the top of the body section is made from "...Acetal loaded with carbon black to minimise UV degradation...", according to the material supplied with it, and the coax socket uses PTFE.

The three groundplane elements mount to the main body with a screw and lock-nut arrangement. The lock-nut tightens itself nicely when the element is screwed in. Each element has a small flattened section near the end to make it easy for fastening with a 6" shifter.



The Longreach is impeccably made. I find it very hard to believe that it won't still be up there, giving sterling service, 20 years from now.

I particularly like the use of stainless steel used for the elements, nuts, washers and grub screws. Bear that in mind when you read the price tag! I agree with the manufacturer's claim that you will get many years of reliable use but I would stress that the tower mounting system you come up with is of critical importance. (You can open the way to unwanted corrosive effects if two dissimilar metals are left in long-term contact with one another.) However, two stainless steel 'hose clamps' are provided for you in the plastic bag. Use them wisely and you'll be right, I should think.

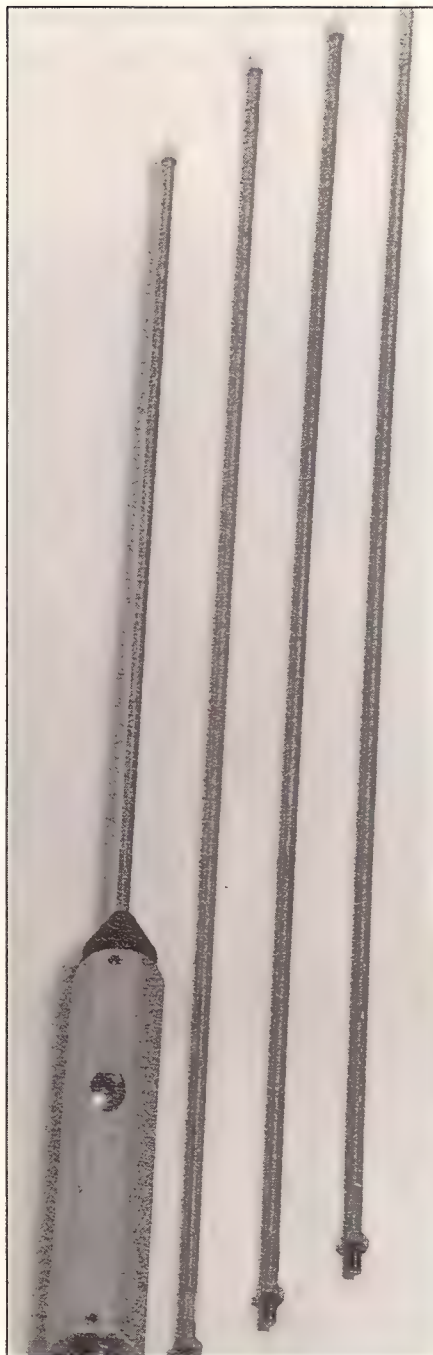
On air, the Longreach preforms as you would expect a good groundplane antenna to do. A quarter-wave antenna isn't a magical design, and this one goes as well as a quarter-wave antenna should. One possible advantage of the groundplane design is that it can usually be pressed into service at the third harmonic without completely destroying the transceiver's finals through serious mismatch.

In testing, we found an SWR of well less than 2:1 at 70cm — not ideal, but certainly acceptable if the situation demands it. The three groundplane elements are inclined down at about 45 degrees and this is responsible for a measured 40 ohms impedance on two metres rather than the more usual 35 or so. The SWR remained below 1.3:1 over the entire two metre band, and a quick check with an MFJ antenna analyser showed a good match over a very wide range — more than 20 MHz either side of the band, in fact. This is what you'd expect of a groundplane, and I'd suggest it would work quite well as a VHF scanner antenna.

From a simple visual inspection, we'd suggest the Longreach would cope with our legal power limit very easily indeed — as well it should, for its recommended retail price is \$150.

Ozennas supplies a few pages of instructions for you. About one quarter tells you not to overtighten the nuts and the other three quarters tells you how not to kill yourself. On the other hand, I see no SWR curves, no diagrams, no photographs, no specifications.

Never mind, apart from the 'manual', this is a product I most assuredly admire. Well done Ozennas.



Above: the Longreach is beautifully made and looks like it should stand the test of time.

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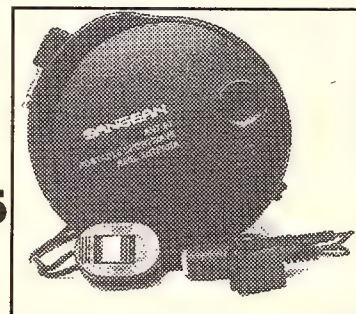
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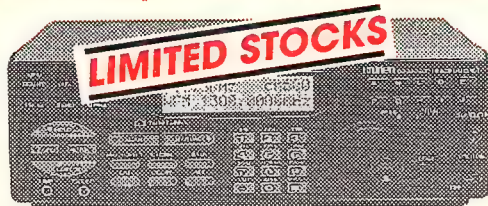
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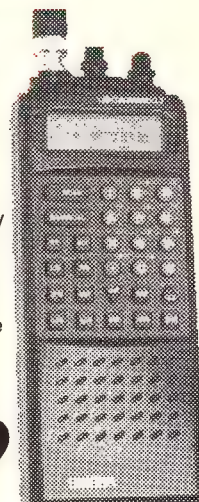


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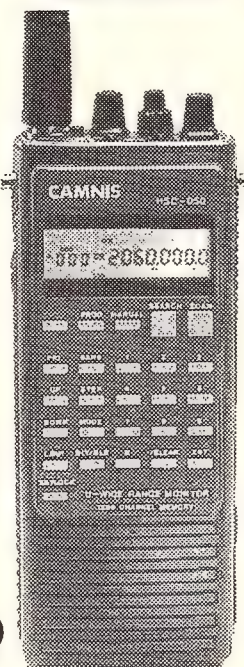
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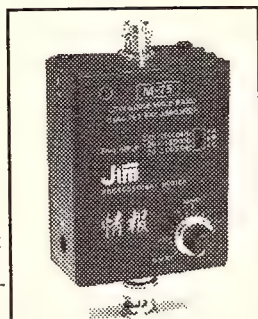
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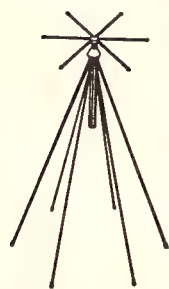
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RF SPEECH PROCESSING

(Or how to get an extra 6 to 9 dB of talk power on SSB)

By Ross Wiley

It has been verified, through extensive tests, that the ordinary voice contains high amplitude peaks which are about 14 dB greater than the average level. It's also been demonstrated that a large portion of the intelligence in a signal is contained in the low-amplitude components.

Voice communication systems, however, are often peak-power limited.

For example, most single-sideband transceivers will output 100 watts peak power (Peak Envelope Power) before they either flat-top and distort or their ALC system cuts in, even though their average (or talk power) output on voice at this time may only be down around 15 to 25 watts.

From these facts one infers that the natural voice may not provide maximum utilisation of the equipment. Put another

way, the talk power is not as great as it could be if the peak-to-average ratio were not so high. If the average can be elevated without overloading on peaks, the weaker components of the voice become more prominent.

Figure 1 illustrates this. The result is that on a noisy, or cluttered, channel, a higher level of articulation is achieved.

In order to reduce the peak-to-average ratio it is necessary to modify the signal waveform.

This inevitably leads to distortion of the voice signal. This distortion in turn reduces the articulation.

From all of this it may be concluded that the best method of speech processing is one that gives the greatest talk power and least distortion. Such a method is **RF speech processing**.

In comparing the various methods of

speech enhancement, we first come to a common form used particularly by the CB fraternity... the so-called 'power microphone'.

The cheaper units found on the market are generally nothing more than a microphone with an audio amplifier built in, and provide very little improvement in performance over the radio's standard microphone.

In fact, in many cases they will reduce speech articulation because of the introduction of additional distortion and room echo.

The better-quality 'power microphone' incorporates audio amplification, audio peak clipping and audio filtering. When used correctly, it can provide up to 4 dB improvement in articulation (or signal-to-noise ratio), over a standard microphone on a radio which is driven to the point of ALC operation. However to achieve this, its peak clipping level needs to be up around 20 dB.

As an aside, audio compression alone can give only about 1 dB improvement in signal-to-noise ratio under these circumstances.

On the other hand, a well-designed RF speech processor which incorporates compression, RF clipping and RF filtering, can give 8 to 10 dB improvement in received signal articulation when set up for 20 dB of clipping.

One may well ask why such a big difference between the performance of audio processing and RF speech processing systems. The main reason for this lies with the fact that any form of peak signal clipping, through its very nature, introduces distortion products to the waveform.

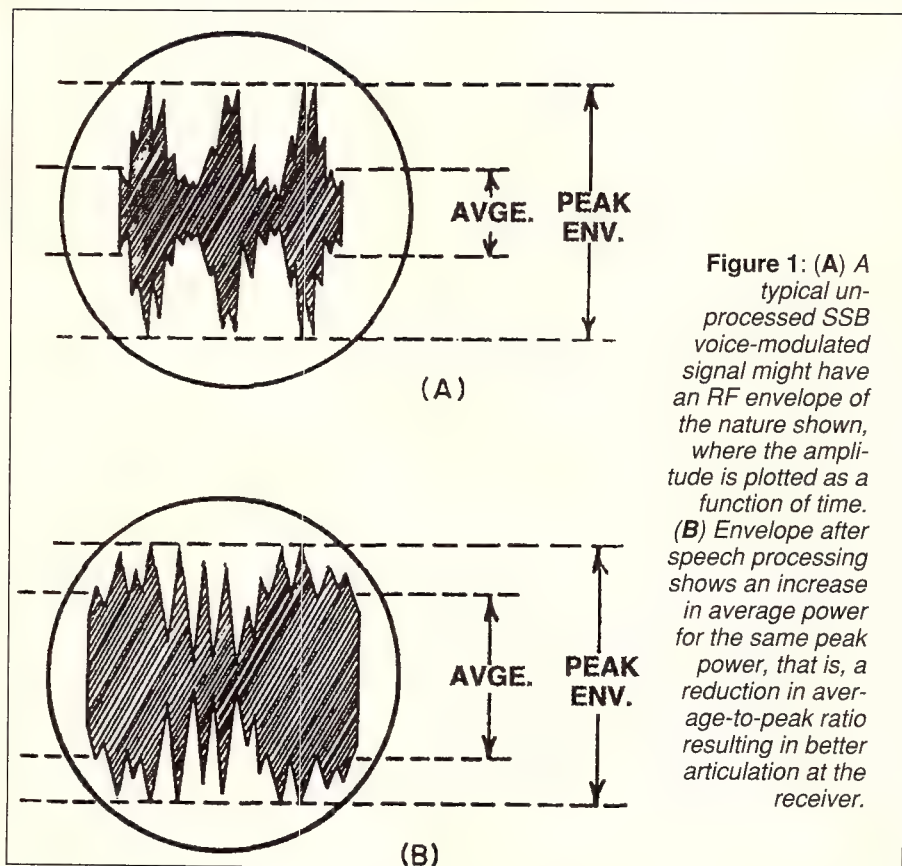
The distortion comes mainly in the form of harmonics generated from the fundamental signal. In order that the speech articulation be maintained at a high level, these harmonics must be removed.

In RF speech processors the unwanted harmonics lie a long way away from the wanted signal's frequency, and are easily removed using quality RF filters. Unfortunately, in audio clipping systems, a number of harmonics lie within the wanted audio band and can't simply be removed, leaving the signal with a high level of distortion and consequent reduced articulation.

For example, it is generally recognised that the minimum bandwidth required for an SSB voice communication system is 300 Hz to 2700 Hz (contrary to this general rule, however, most SSB CB radios have bandwidths of 300 Hz to 4500 Hz).

The presence of audio frequencies between 300 Hz and 1300 Hz are important for good articulation.

The second harmonic of 300 Hz is 600 Hz while that of 1300 Hz is 2600 Hz. Both



of these frequencies, and those between them, lie within the desired voice band and can't be removed without affecting the wanted signal.

What constitutes a good quality stand-alone RF speech processor?

If an RF speech processor is to perform its task properly it should contain the following sub-sections: an audio compressor, single-sideband generator, RF peak clipper, RF bandpass filter and product detector.

The function of each of these components will be discussed separately below.

For additional details see also the block diagram in **Figure 2**.

An audio level compressor should be incorporated so that the RF stages, particularly the peak clipper, are supplied with a constant average signal level. It has been found in practice that compression in the order of 20 dB is required in this stage.

The single-sideband generator follows the audio compressor in order to produce an RF waveform suitable for peak clipping.

It consists of a carrier oscillator, balanced modulator and bandpass filter. The waveform it presents to the peak clipping stage is that of a single-sideband suppressed carrier signal.

Additional linear RF amplification and amplitude peak clipping is the task performed by the RF peak clipper. For maximum increase in articulation of the received signal approximately 20 dB of clipping is required.

The waveform after clipping is that of a very distorted signal made up of fundamental frequencies and many high-amplitude harmonics.

It is then applied to an RF bandpass filter of the same type used in the single-sideband generator stage.

The filter output waveform, now virtually free of distortion, is ready to be put to use in the next stage of the RF speech processor.

The final stage, a product detector, converts the processed RF signal back to audio frequencies.

It consists of a carrier generator (sometimes known as a beat frequency oscillator or BFO) and a balanced demodulator.

Audio output from the product detector, now fully processed, is level-adjusted and available for application to the microphone input of a radio.

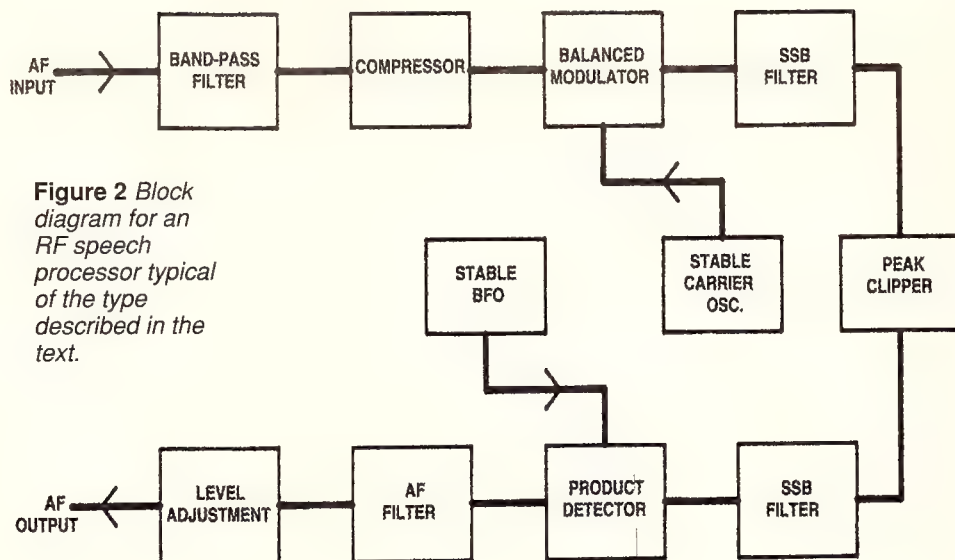


Figure 2 Block diagram for an RF speech processor typical of the type described in the text.

Because very high gains are used within an RF speech processor, both in the audio compression and RF clipping stages, the designer must be well aware of the possibility of RF feedback problems occurring.

A properly-designed unit, such as the one mentioned below, will have all external connections filtered in an effort to guard against this.

A stand-alone RF speech processor, like the CEC (Communication Equipment Company) SP-500 manufactured by GFS Electronics, may incorporate other convenience functions in addition to that of RF speech processing.

For example the SP-500 also has an ETB (End of Transmission Beep), which is selectable between a single short duration 20 millisecond tone of 1800 Hz (the Morse Code letter 'E' if you like) or the Morse Code letter 'K' (long-short-long tones) sent at a speed of approximately 25 words per minute.

CEC's SP-500 additionally allows its user to inhibit the ETB completely, including the PTT delay.

A 10 segment LED bargraph level indicator is also built into the SP-500, as well as switching, to allow the quick and easy by-passing of the processor for 'with' and 'without' comparison purposes.

In concluding, if you would like a bigger signal and your current radio set-up is already running at the legal peak power limit, or you just can't afford a big linear amplifier, consider RF speech processing as an option.

It is a very appropriate and clean method of increasing power legally for minimum outlay.

References

- 1 Sabin, 'RF Clippers for SSB,' QST, July 1967.
- 2 Squires & Clegg, 'Speech Clipping for SSB,' QST, July 1964.

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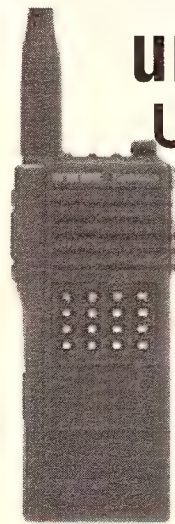
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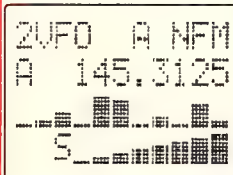
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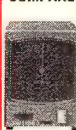
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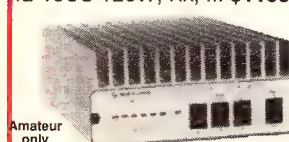
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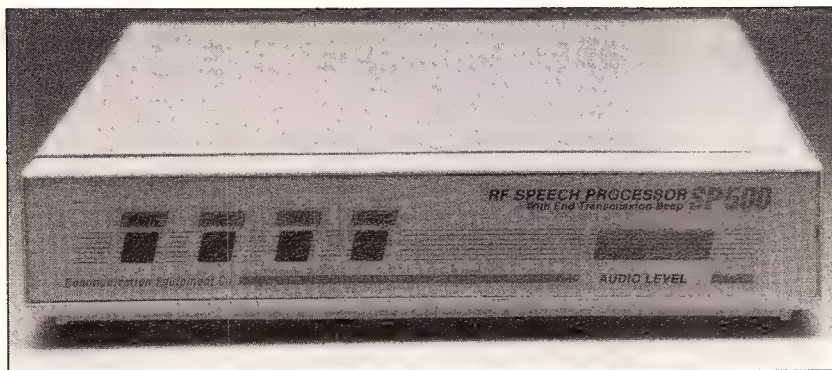
How to boost the signal, eh? What we want is something inexpensive to make a BIG impact on your signal, not your wallet.

Have you considered a properly-constructed and beautifully thought-out speech processor? Human speech is so designed that its intensity varies from quite small to quite solid. The problem with human speech is that the average level is down at the small end of things. A speech processor, as I am quite sure you are aware, pulls both of those levels together. It brings up the weak bits and 'compresses' the peaks down. The net result is an audio output which is amazingly more consistent in terms of level.

Using speech processing

Plug a microphone in one end of a well-designed speech processor and plug the other end to the 'mic' socket on the rig and then sit back and yak. That is how simple the concept is. The model **SP-500** made and distributed by **GFS Electronics** works just well as you could wish. In return for such efforts, you will transmit compressed and clipped audio fit for a king. A king, though, who must know a few important rules:

1. It is only on **SSB** transmissions that the effectiveness of processed speech really become apparent. The meter needle or LED display on the transmitter (showing you the RF output level) stops dancing around like a twitty teenager and strikes a more stable pose — right up at the high end of the scale. On SSB the effects are amazing — but using a speech processor on your FM rig (imitating what the commercial radio stations do) can only harm already well thought-out audio for the majority of listeners. I will



concede one point on that matter though: if the station at the other end is mobile, that operator may well find processed audio a treat.

2. The good news about speech processing is that used properly on SSB, your signal will sound louder and be far more impressive than it would otherwise be at the other end of a difficult path. The bad news is that if you give the rig a really good belting in this way, it may well warm up the final output stage a tad too much — particularly if your 'finals' are not designed or rated for what is effectively full power output through your extended overs.

You see, that's basically what speech processing promises. By making your rig stay at the maximum possible output power for the largest percentage of the time, you will most certainly sound louder. What a pity that some people you hear on the air wind these gadgets up way beyond that — and blame their speech processor for their ghastly audio as a consequence!

3. Be sure to perform lots of on-the-air tests to determine the level settings you actually need. Too much gain and there will be 'splattering', damaged airwaves, TVI and generally an upset environment (read 'upset other users!').

The best speech processors clip and compress their audio. The problem is that, in doing so, it generates all kinds of crud — sort of counter-productive if you think about it. The SP-500 gets around that in the best possible way. That innocent little box with almost a total absence of user-adjustable controls has a few underlying characteristics to it which may raise an eyebrow or two.

Looking at the block diagram in this case shows careful and intelligent design processes have been followed throughout, with a

Speech processing the Australian way (beep)

By Morrie Bund

good final result the almost-inevitable outcome. GFS starts the audio processing off with a band pass-filter for audio on entry to the unit, followed by a compressor, a balanced modulator and filter for SSB generation, an RF clipper, another filter to sanitise the clipping, a product detector, low-pass filter and a well-concealed output level control. Now, that smacks of real class — it is almost an SSB transceiver in itself!

On air

On **FM**, as you might guess by now, the thing sounds *dreadful* unless it is wound back to the scratchy end of the pot — and *do* I mean the scratchy end! Hey GFS, is it just me or are the output levels a whisker too high? With just a little tweak, you become what sounds like a cross between Peter Harvey from Canberra and an F-111. What a horrible thought...

On **SSB**, with just the right amount of level adjustment, your signal ends up there with the big guns. One notch too far and the band is chockers with your crud from top to toe. But get it right and they'll swear you've unleashed a linear!

So how do I rate the SP-500? I will answer that in two ways. Before finding where the stupid output level control was hiding (no, don't undo the book-sized cabinet to find it) I the SP-500 was shaping up as a Frankenstein device and this opinion was well shared with my radio neighbors. Once having found it, though, I discovered that this unit is one of the best on the market. It sounds so simple. It makes the outgoing audio level sound much louder and fills the gaps when the going is tough. What's more, it hardly changes the tonal quality of the audio on the way through, and that's not a bad effort for any speech processor.

Want a speech processor? Try a cheapie and I guarantee one thing: you will cop some real flak. Try a beautifully-aligned RF speech processor like this one, though, and provided you've set it up properly, you will have a following of adoring admirers.

BEEEEEP!

But really, do I want those dreadful beeps or Morse Ks at the end of each over? The so-called 'roger beep' — which immediately reminds one of the lunar lander efforts of the late 1960s — is quite common on CB but is sort-of frowned at on the amateur bands.

The funny thing, though, is that many amateurs lurking at the bottom end of two metres (where SSB is the only way to go and thousands of kilometres is the aim) end their overs in marginal contacts by whistling the letter K in Morse Code.

Dah didah they go, and the designer of this fine piece of gear has spent some time on two metres, because you can choose to end each over with the CBer's roger beep or the two metre SSB user's Morse K.

Or, of course, you can end your over in the traditional way. The rear-panel tone switch has a third position: silence.

Summary

The SP-500 is a beautifully designed and presented speech processor. RF clipping and filtering is the way to go if you have the time and energy.

It weighs 750 grams, needs 12 volts at 300mA (a quality plug pack is supplied) and it both clips and compresses at a fixed 20 dB level. The user has nothing to set or to do in practice. You get to see the speech level on the front panel and get to disable the fanfare at the end of each over if you wish.

I found the SP-500 to be immensely effective on difficult path SSB use and of some marginal use on FM with stations in noisy environments. RF clipping and processing? Way to go!

PS. After almost blowing up a couple of rigs we found the level control and wound it back a LONG way. It's on the bottom of the case...

R&C thanks **GFS Electronics** for the supply of the review processor.

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YET ANOTHER VSWR STORY. (BUT WAIT, THERE'S MORE!!)

By Philip Clark, VK1PC

When energy is poked into one end of a system, we generally hope that most of it comes out again to do something useful, such as communicate somewhere.

If all the energy is lost, we have what is referred to in radio terms as a 'dummy load'. All this succeeds in doing is supplying some energy, in the form of heat, to the surrounding area. Due

If two or more of the components in a system are not matched, the maximum energy transfer will not take place to or from the component that is not matched.

This seems all fairly straightforward until this question is asked: "But what happens to the energy that is not transferred?" Aah...

Because all the energy cannot be transferred, and because it is in a closed system, some is therefore not 'used'.

This means that the 'unused' energy cannot be dissipated as heat or by any other means at this point (not 'used', remember), and it cannot get out.

So where does it go? Well, it does the obvious thing — it gets reflected back down the system the way it came.

The interaction of this reflected energy and the energy travelling forward causes **standing waves**. It is the interaction of two travelling waves of the same frequency moving in opposite directions that results in standing waves.

Let's now define the 'system' I have been talking about:

The simplest system, and usually the one that causes the most arguments, consists of a transmitter and receiver, a cable and an antenna.

Now, the idea of this system is to take the energy generated by the transmitter and transfer it to the antenna as efficiently as possible. Likewise, it is also supposed to take any energy received by the antenna and transfer it to the receiver.

All this seems very simple and straightforward, doesn't it? So what are all the arguments about?

Also for the purpose of this discussion, we will assume that the system is a 50 ohm system (the number that most of you will be comfortable with) and that the cable connecting the components is coaxial cable.

All components of the system must be matched, even the VSWR meter being used to take the measurements!

I can hear some eyebrows shooting up! You didn't know that VSWR meters had a correct impedance?

Yes, they do, and you must use a 50 ohm meter in a 50 ohm system or the reading you will get will be wrong, misleading and incorrect (get the message!) and you will probably finish up with your antenna X metres too long or too short!

So now where do most of the problems occur in this simple and most common of systems?

The first problem is that of simply getting energy from the antenna to the equipment and vice versa. Unfortunately, we do not live in a perfect

I can hear the groans already. "Not another story about VSWR!" But, I hope, this one will be of some practical use. Some readers may already be asking "What is VSWR?"

VSWR stands for **Voltage Standing Wave Ratio**.

Why have VSWR and not just SWR? Well, there are two standing waves in a system — one is **voltage** and the other is **current**. We usually use the voltage wave for measurement because it is easier to measure. I am sure that some bright spark (pun intended) will realise that voltage times current is power, so why not measure that instead? There is a measurement that uses power (called return loss), but this is outside the scope of this article, although it is mathematically related to VSWR.

I have written this article mainly for those who do not have a great technical knowledge so that they might be able to make some very practical use of VSWR measurements instead of just trying to achieve the almost impossible (and sometimes undesirable) 'perfect' VSWR of 1:1. I also hope that those with more technical knowledge will find something of value and perhaps a few tips that might even help them in their quest for a better installation.

First, just what is this VSWR, or as it is more commonly called SWR, that is so often quoted?

to the cost and complexity of the equipment used to generate the energy, most of us would not consider this to be a useful purpose!

In order to get the maximum transfer of energy from one end of a system to the other, all the components of the system must be 'matched' to one another. I am not going into a great explanation of matching here, so for our purpose we will define 'matched' as simply having the same impedance.

Notice that I have used the term 'impedance' here and not resistance. The reason for this is that in this article we are talking about radio energy, which has an alternating waveform, and is affected by capacitance and inductance as well as pure resistance.

These effects are found in coils, capacitors and resistors, but I would like to point out one very important fact at this time: *all* components, even a straight piece of wire, have some capacitance, inductance and resistance, even if one or more of the three may be very small. Even the very small quantities begin to have noticeable effects as frequency increases.

I only mention this to let you know that certain effects can occur that may be very difficult or impossible to measure directly with the equipment available to the average amateur or CB operator, but they will effect other readings that you make, including VSWR.

TABLE 1 Typical cable loss per 100 metres. 50 ohm cables.

Cable type	10 MHz	100 MHz	200 MHz	400 MHz	1000 MHz
RG8	1.6	5.9	8.5	12.5	20.5
RG9	2.2	7.2	10.5	15.4	29
RG58	4.6	16.1	24	38	71
RG174	12.5	29.2	24	58	99
RG213	2.2	7.2	10.5	15.5	29
BEL 9913	2.1	4.6	5.9	8.5	15

YET ANOTHER VSWR STORY

(continued from previous page...)

world, and the cable we use is also not perfect.

This means that not all of the energy that we poke in at one end will come out the other. This is called loss, and how much loss there is depends mainly on two things — the type of cable and the frequency being used. See **table 1**. Note: Actual losses may vary due to minor manufacturing or type differences.

Beware of cables that are labelled as something *type*, etc. Some of these may be better than the 'type' they represent, but some may be only low voltage cable or have other characteristic differences, and may not be suitable for more than a few watts of power. This particularly applies to cables from computer or data installations. If the cable is labelled as something *type*, check carefully!

Besides just loss, which can be controlled by the careful selection of cable for the frequency being used, the other main problem which most often occurs is that of matching the antenna to the connecting cable. Fortunately, manufacturers of equipment kindly make most transmitters and receivers ready to

TABLE 2	
VSWR Reading	
Cable Loss	With End Open
1.00	>-20.00
1.0653	-15.00
1.10	-13.22
1.20	-10.41
1.2222	-10.00
1.30	-8.85
1.40	-7.78
1.50	-6.99
1.60	-6.37
1.67	-6.00
1.70	-5.86
1.80	-5.44
1.90	-5.09
1.925	-5.00
2.00	-4.77
2.20	-4.26
2.50	-3.68
2.70	-3.38
3.00	-3.01
4.00	-2.22
5.00	-1.76
7.00	-1.25
8.70	-1.00
10.00	-0.87
20.00	-0.43
50.00	-0.17

match 50 ohm cable, so there is not usually a problem at that end.

Manufacturers of commercial antennas generally are very careful in their design and testing to ensure that their antennas will correctly match a 50 ohm system *provided* they are adjusted and used according to instructions. If you have to make adjustments which are significantly different from the manufacturers' settings, you can be almost certain that something is wrong!

Okay, now we get down to the nitty-gritty! You have your transmitter/receiver connected to a cable which is connected to an antenna.

Now you want to find out if everything is correct. Most Cbers and amateurs will simply connect the VSWR meter between the transmitter and the cable and attempt to take a reading at that point.

Boy, can you mislead yourself *here* if you don't know what your cable loss is!

How can you find out what the cable loss is? Well, you could look up the table for the type of cable and frequency and make a fairly educated guess. You would probably be fairly close, unless there is something else wrong as well.

A better way would be to actually measure that cable loss using your VSWR meter!

Now, how to go about this? First, you will need to check the manual for your transmitter to see if it can operate for a short period (preferably at reduced power) into an open circuit. If this cannot

TABLE 3

VSWR	Cable Loss	Cable Loss	Cable Loss	Cable Loss	Cable Loss	Cable Loss	Cable Loss	Cable Loss
Actual	-1.00	-2.00	-3.00	-4.00	-6.00	-10.00	-15.00	-20.00
	VSWR	VSWR	VSWR	VSWR	VSWR	VSWR	VSWR	VSWR
	Reading	Reading	Reading	Reading	Reading	Reading	Reading	Reading
1.02	1.02	1.01	1.01	1.01	1.00	1.00	1.00	1.00
1.15	1.12	1.09	1.07	1.06	1.04	1.01	1.00	1.00
1.25	1.19	1.15	1.12	1.09	1.06	1.02	1.01	1.00
1.4	1.31	1.24	1.18	1.14	1.09	1.03	1.01	1.00
1.5	1.38	1.29	1.22	1.17	1.11	1.04	1.01	1.00
1.6	1.45	1.34	1.26	1.20	1.12	1.05	1.01	1.00
1.7	1.52	1.39	1.30	1.23	1.14	1.05	1.02	1.01
1.8	1.59	1.44	1.33	1.26	1.15	1.06	1.02	1.01
1.9	1.65	1.49	1.37	1.28	1.17	1.06	1.02	1.01
2	1.72	1.53	1.40	1.31	1.18	1.07	1.02	1.01
2.2	1.85	1.62	1.46	1.35	1.21	1.08	1.02	1.01
2.4	1.97	1.70	1.52	1.39	1.23	1.09	1.03	1.01
2.5	2.03	1.74	1.55	1.41	1.24	1.09	1.03	1.01
3.4	2.53	2.05	1.75	1.55	1.32	1.12	1.04	1.01
4.5	3.04	2.34	1.94	1.68	1.38	1.14	1.04	1.01
7	3.95	2.80	2.20	1.85	1.46	1.16	1.05	1.02
8	4.23	2.93	2.28	1.90	1.49	1.17	1.05	1.02
15	5.56	3.47	2.56	2.07	1.56	1.19	1.06	1.02
20	6.11	3.66	2.66	2.13	1.59	1.20	1.06	1.02
40	7.18	4.00	2.82	2.22	1.63	1.21	1.06	1.02
100	8.03	4.24	2.93	2.28	1.65	1.22	1.06	1.02
Infinite	8.72	4.42	3.01	2.32	1.67	1.22	1.07	1.02

be safely done, you will have to find some other way of generating enough energy at the correct frequency to obtain a reading on your VSWR meter.

- Disconnect the coaxial cable from the antenna and leave it open circuit.
- If your transmitter does not have adjustable power output, skip this next step: adjust your transmitter to its lowest power setting.
- Adjust the calibration control on your VSWR meter to obtain the 'SET' reading. If you cannot do this by the time that the calibration control is at its most sensitive, increase to power a little at a time until the meter reads at the 'SET' position.
- If your transmitter power output cannot be adjusted, and if it is safe to operate your transmitter into an open circuit, key the transmitter and adjust the calibration control on the VSWR meter until it reads the 'SET' position.
- Read the VSWR with the cable open circuit.

From table 2, read off the cable loss that corresponds to the VSWR reading obtained. Simple when someone has worked out the table, isn't it!

You will possibly have noticed something odd about the table. Notice that, with a cable loss of more than about

10dB, the reading changes very little? Also notice that if your cable loss is more than 20dB, it will behave as a 'dummy load'.

It does not matter *what* happens at the far end, it won't affect your rig! Pity if you are trying to read the VSWR of the antenna from the shack, though!

But don't try to put too much power into it because it will get hot and may even melt!

Okay, so you did not have 20dB of cable loss, but a much more reasonable figure of between 1dB and 4dB (or thereabouts).

Most operators find it more than a little difficult to lug the equipment onto the roof or up the tower to read the VSWR of the antenna, but that's where it *should* be read, right at the antenna.

Now, because someone (me) has drawn up another handy table, you can read the VSWR from inside your comfortable shack, then knowing the cable loss you can read the actual VSWR of the antenna from the table.

Table 3 is a listing of far end VSWR compared with the reading obtained, knowing the cable loss.

Notice that for cable losses of more than 6dB, the readings of the remote end are of little value. In fact, they are

probably outside the measuring tolerance of most VSWR meters and should not be regarded with any degree of accuracy.

This also gives you a means of checking your cable and antenna quickly and easily after storms and the like, or whenever you suspect something has changed drastically.

By the way, assuming that your cable loss measurement was correct in the first place, when your antenna is connected, if you get a VSWR reading which is greater than the table says is possible for that particular cable loss, then you have a problem with your measuring system.

Just imagine what your comments can be the next time some poor unsuspecting soul asks you why they can't seem to talk to distant stations on their UHF CB when they explain that they are using 50 metres of RG58 cable between the set and antenna, that they have a perfect VSWR of 1:1, and the man at the shop said that should be really good!

So there the tables are for you to refer to in future, and now the VSWR readings that you obtain on the transmitter end of your cable will be able to give you a good indication of what is happening at the other end.



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CNV/UHF 100-500 MHz **\$165**

All models are 50 ohms and have 3 power ranges: 15/150/1500W

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Ideally, your HF-SSB radio would always be perfectly tuned to your antenna – for maximum range and clarity. It's a goal that's been easy to wish for, but not so easy to achieve. Until SGC developed the intelligent, micro-processor-controlled, SG-230 Smartuner®.

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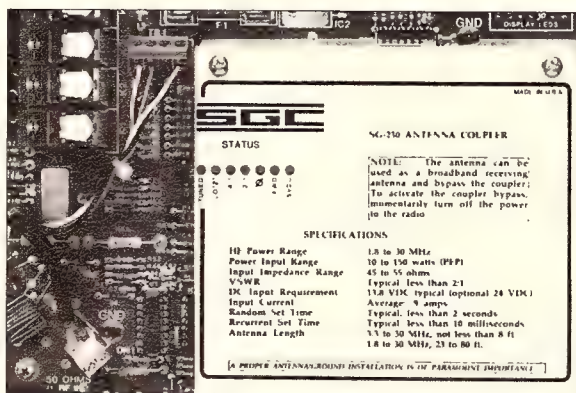
Smartuner® automatically evaluates and switches 64 input and 32 output capacitance combinations, plus 256 inductance combinations in a "pi" network—over a half-million precision matches. Smartuner® then remembers the chosen frequency and tuning values and automatically reselects those

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FREQUENCIES!!

HOT

Using a scanning radio receiver can be a fascinating hobby in its own right. While some people choose to stick with a single kind of service — even a single channel — others like nothing more than searching the bands for hours.

It's quite amazing what you can find, and virtually everything you can tune to is fair game for the scanner freak. With only a few limitations imposed by law, you can listen to anything save signals travelling via phone lines. What you choose to reveal when discussing your listening with others is also covered by laws.

But actually *listening* to the radio is, as we've said, pretty clear from a legal point of view. So where do you start? What radio should you use, and where do you tune it? More to the point, where's the really HOT action happening? It's questions like these which need to be answered by a specialist, and our scanning correspondent, Russell Bryant, is just the bloke for the job.

This month Russell sets out to answer the basic 'where do I start?' question...

Welcome back

As Freddie Kruger was given to ask, "Miss me?" Well, I am back. A brand new magazine, and a brand new column.

Hot Frequencies is different to my previous scanning columns. For a start I welcome reader input as far as the articles you would like to see here. Unlike Scan '95 and Scanning Action before that, I won't be answering questions about antennas, scanners or which frequency to listen to in Kickatinalong or Upper Kumbukta West. More on that topic later.

Scanning is unlike most other hobbies or pastimes. There are no rules as such to follow, no special jargon to learn, no difficult procedures to adhere to. All you need is a scanner and away you go. After a while you will probably pick up a few sporadic transmissions... however you will more than likely miss the action.

A need to know

Knowledge of the RF bands is, apart from the operation of your scanner, the only other information important to the pursuit of the hobby. After all, if you are looking for radio transmissions relating to aircraft, it is no good searching the 40 MHz band. Conversely, skip from the US is unlikely to occur on the 900 MHz allocations.

It makes sense first up to take a few minutes to check out the frequency spectrum, just to see who is where.

The average scanner covers the bands from 30 MHz to 1,000 MHz, usually divided into dozens of sub-bands, which are further broken up into user-programmed channels. The list below features a breakdown of the frequency limits for the spectrum from 29.700 MHz to 960 MHz inclusive. Check it out.

29.700	31.000	Low-power models, cordless telephone outputs	56.000	63.000	TV channel 1
31.000	32.000	Repeater outputs — 50 channels	63.000	70.000	TV channel 2
32.000	33.000	Defence allocation	70.000	70.24375	Simplex; 19 channels
33.000	34.000	Repeater inputs, 50 channels; skip from the US and South Africa occurs here frequently	70.24375	72.29375	Repeater outputs; 164 channels
			72.29375	72.74375	Simplex; 36 channels
34.000	35.000	Defence allocation	72.74375	74.800	Repeater inputs; 164 channels
35.000	36.000	Repeater outputs; 50 channels	74.800	75.200	Aircraft navigation band
36.000	37.000	Remote-control models	75.200	77.29375	Simplex; 167 channels including current Queensland Police VHF allocations, current NSW Ambulance systems, Tasmania Police channels
37.000	38.000	Repeater inputs; 50 channels	77.29375	77.49375	Simplex; 16 channels
38.000	39.000	Defence allocation	77.49375	79.80625	Repeater outputs; 185 channels including future NSW Police, ambulance and fire allocations, current WA Police, fire and St John Ambulance frequencies
			79.80625	79.99375	Simplex; 15 channels
			79.99375	82.30625	Repeater inputs; 185 channels
			82.30625	82.49375	Simplex; 15 channels
			82.49375	83.74375	Repeater inputs; 100 channels including current Queensland Ambulance frequencies
			83.74375	84.69375	Repeater inputs or simplex; 76 channels
			84.69375	84.99375	Simplex; 64 channels
			84.99375	86.24375	Repeater outputs; 100 channels
			86.24375	87.19375	Repeater outputs or simplex; 76 channels
			87.19375	87.500	Simplex; 24 channels
			87.500	108.000	FM broadcast band
			94.000	101.000	TV channel 4
			101.000	108.000	TV channel 5
			108.000	118.000	Aviation radio navigation band
			118.000	137.000	Aviation radio communications band
			137.000	144.000	TV channel 5A
			144.000	148.000	Amateur radio two metre band
			148.000	149.250	Paging service; 50 channels
			149.250	149.75625	Repeater outputs; 80 channels
			149.75625	149.900	Simplex; 11 channels
			150.000	151.39375	Repeater outputs; 107 channels
			151.39375	152.49375	Simplex; 88 channels
			152.49375	153.850	Simplex; 108 channels
			153.850	154.35625	Repeater inputs; 80 channels
			154.35625	154.65625	Simplex; 23 channels
			154.65625	156.000	Repeater inputs; 107 channels
			156.000	157.450	Maritime mobile allocations
			157.450	158.29375	Repeater inputs or simplex; 80 channels
			158.29375	160.600	Repeater inputs; 184 channels
			160.600	160.975	Maritime mobile allocations
			160.975	161.475	Simplex; 39 channels
			161.475	162.050	Maritime mobile allocations including Seaphone services
			162.050	162.89375	Repeater outputs or simplex; 67 channels
			162.89375	165.19375	Repeater outputs; 184 channels including Victorian State Government Radio Network, Country Fire Authority of Victoria and Country Fire Service of South Australia

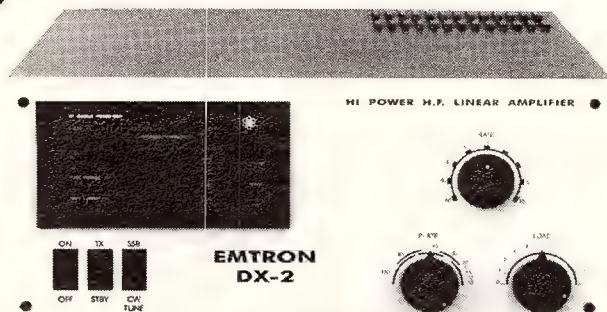
165.19375	168.19375	Trunked repeater outputs; 240 channels	418.075	420.000	Repeater outputs; 77 channels including government railways systems
168.19375	169.79375	Simplex; 128 channels including current South Australia Police VHF system and Victoria Police VHF channels	420.000	450.000	Amateur radio 70cm band, radiolocation service
169.79375	172.79375	Trunked repeater inputs; 240 channels	450.000	450.500	Simplex; 20 channels including NSW Railways
172.79375	173.29375	Simplex; 40 channels	450.500	452.500	Links; 120 channels
173.29375	174.000	Simplex; 56 channels	452.500	460.000	Repeater inputs; 340 channels
174.000	181.000	TV channel 6	460.000	462.000	Links; 120 channels
181.000	188.000	TV channel 7	462.000	469.500	Repeater outputs; 340 channels including Australia-wide 64-channel police allocations, Melbourne Metropolitan Fire Service, Queensland Fire Service and many State Emergency Service groups, Northern Territory Police, Fire and Corrective Service
188.000	195.000	TV channel 8	469.500	470.000	Simplex; 20 channels
195.000	202.000	TV channel 9	470.000	471.2125	Repeater outputs; 50 channels
202.000	208.000	Distance Measuring Equipment	471.2125	472.2125	Simplex; 40 channels
208.000	215.000	TV channel 10	472.2125	474.800	Repeater outputs; 100 channels
215.000	222.000	TV channel 11	474.800	475.200	Simplex; 16 channels
222.000	225.000	Distance Measuring Equipment	475.200	476.4125	Repeater inputs; 50 channels
225.000	400.000	Defence allocation, including military and some civil aircraft traffic, Aircraft Instrument Landing Systems, US Navy Fleet Satellite Communications System	476.4125	477.4125	UHF Citizens Band Radio Service; 40 channels
400.000	403.000	Weather aids	477.4125	480.000	Repeater inputs; 100 channels
403.000	404.000	Repeater inputs; 40 channels	480.000	484.800	Repeater inputs; 190 channels
404.000	405.000	Links; 40 channels	484.800	485.200	Simplex; 16 channels
405.000	405.9875	Repeater inputs; 40 channels	485.200	490.000	Repeater outputs; 100 channels
406.1125	408.625	Trunked repeater inputs; 200 channels	490.000	494.800	Repeater outputs; 190 channels
408.625	410.550	Repeater inputs; 77 channels	494.800	495.200	Simplex; 16 channels
410.550	411.550	Simplex; 40 channels	495.200	500.00	Repeater inputs; 190 channels
411.550	412.450	Simplex; 72 channels	500.000	501.000	Repeater outputs; 80 channels including Telecom NSW internal trunking system
412.450	413.450	Repeater outputs; 40 channels	501.000	505.000	Use as yet undetermined
413.450	414.450	Links; 40 channels			
414.450	415.4375	Repeater outputs; 40 channels			
415.5625	418.075	Trunked repeater outputs; 200 channels, including NSW Government Radio Network and private trunking systems			

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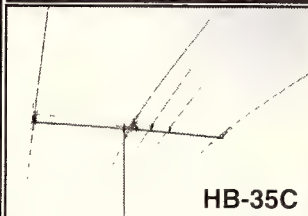
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TE-14	rotatable dipole	\$325
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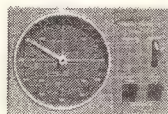
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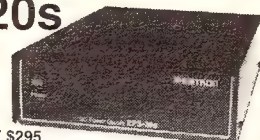
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Regulation:	+/- 0.25V at nominal mains
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Size:	60mm x 185mm x 300mm

EPS-20s



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505.000	507.000	Repeater outputs; 240 channels
507.000	509.525	Repeater outputs; 100 channels
509.525	510.000	Simplex; 20 channels
510.000	511.000	Repeater inputs; 80 channels
511.000	515.000	Use as yet undetermined
515.000	517.000	Repeater inputs; 240 channels
517.000	519.525	Repeater inputs; 100 channels
519.525	520.000	Simplex; 20 channels
526.000	820.000	Television channels; band IV and V
820.000	825.000	Trunked repeater inputs; 200 channels
825.000	845.000	Analogue cellular telephone inputs; 666 channels
845.000	852.000	Studio-to-transmitter broadcast links
852.000	860.000	Links and low-capacity services
860.000	861.000	Not allocated
861.000	865.000	Cordless telephones
865.000	870.000	Trunked repeater outputs; 200 channels
870.000	890.000	Analogue cellular telephone outputs; 666 channels
890.000	900.000	Digital cellular inputs
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945.000	950.000	Telecom Digital cellular outputs
950.000	955.000	Optus Digital cellular outputs
955.000	960.000	Vodafone Digital cellular outputs

To say that this is a detailed map of the RF spectrum would be an overstatement. It does, however, provide you with an overview of the boundaries and capacities of many of the sub-bands found from 30 to 1,000 MHz.

New rules

Several years ago Australia, via the then Department of Transport and Communications, as a signatory to many world conventions relating to radio frequencies, decided to conform to global standards.

One such standard was the adoption of alternative channel separation on several sub-bands. The list above conforms to the 12.5 kHz plan being implemented within the VHF mid-band, 70-90 MHz and the VHF high band, 148-175 MHz.

Most, if not all, users of those bands will be required to move to new allocations by 1999. This presents a brand new challenge to the scanner enthusiast to track and identify the fresh channels. Which brings me to another subject...

Now for something completely different

It has been well documented that scannerists are, on average, fairly complacent types, not wanting to venture beyond the warm comfortable police, fire and ambulance frequencies. This fact is evident not only in Australia, but across the world.

But by ignoring the known and exploring the unknown, a whole new world of listening will open up to you. Occasionally at **Hot Frequencies** I will endeavor to provide you, the inquisitive scanner user, with a look at the different and unconventional radio spectrum consumer.

While the unusual will receive coverage, so too will the everyday agencies, such as emergency services, councils, security groups, and so on. The coverage will be Australia-wide.

If there is a particular group or topic that you would like to see mentioned here, please drop me a brief note outlining your desire — please remember, no question and answer letters.

The address is: Russell Bryant, PO Box 344, Springwood, NSW 2777

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DSP-1232 SCALL DSP-2232 SCALL



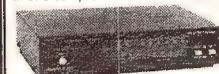
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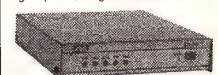


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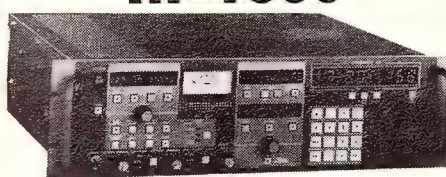
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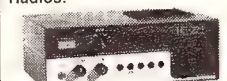
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L SPR.05

SSB Engineering Volume 3	\$21.50
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Have you given out a signal report lately?

During the recent John Moyle contest one of our team — Andrew, VK1DA — secured a contact with another field station on 144MHz and arranged to attempt a contact on 432MHz. Contact was established and Andrew gave a report of something like five by four. The other station returned and gave us the news that we were readability five and strength zero.

Apart from the fact that the relative receiver performance of our two stations might be radically different, what on earth is five by zero?!! When Andrew queried this, the other operator explained what we feared: the signal strength meter was not deflecting therefore we were strength zero!

The first receiver I built had many features, however, an S-meter was not included. How did I ever cope? Very easily actually. If a signal was audible, even though not perfectly readable, it was at least strength one. If the readability was perfect then the signal was probably strength two or more. Beyond that was pretty arbitrary and much less relevant.

A quick revision of your knowledge of signal strengths needn't exhaustively examine each number, but I would love to draw your attention to strength one. Strength one is an interesting number in the scale as it is virtually a cross-over into the realm of the readability scale. Strength one is defined as 'weak signals, barely perceptible'. In view of this, it is somewhat incongruous to combine readability five with such a weak strength of one. To offer a report of five by zero is literally beyond the dizzy, lower limit!

Bear in mind I am sticking to your ear's ability to estimate strength, not the irrelevance of the gyrating galvanometer which adorns the front panel of your black box.

So let's go back to our fellow field day operator who confirmed that we were readability five but strength zero. Does this mean that he was able to cope with a signal that was a full increment below a weak signal

that was barely perceptible? Of course it doesn't, however, signal reports weren't invented just to enable operators to flatter one another with big numbers.

A signal report, in the context of scientific experimenters, conveys vital information on the quality of the communication path, measures enhancements and degradation as station changes are made, reflects current conditions and possible changes. Most importantly of all, a signal report enables stations to determine what level of detail or rate of information exchange can be conveyed at that moment. It is pointless to launch into a chatty detailed exchange prior to exchange of meaningful reports. You might be wasting your breath!

How sloppy it sounds, during contests, to hear a station saying "...you are five by nine, could you please repeat your call sign and your number again...?". If you haven't heard the other station clearly, due to any num-

*...the irrelevance of
the gyrating
galvanometer
which adorns the
front panel of your
black box...*

ber of impediments, then they don't qualify for readability five. By indicating that you are only copying readability three or four, the required level of repetition, clarification or emphatic operating style can be employed to complete the exchange of report and/or number to complete an important contact.

Just as an aside, not nearly as annoying but equally sloppy, when are thinking operators going to stop this business of quoting reports of "...you are forty (or even sixty) decibels over strength nine..."? For a start, if you are strength nine you are a very strong signal. Beyond strength nine is like adding superlatives to superlatives!

More importantly, many of these reports take place on the HF bands, particularly 3.5 and 7MHz. Modern transceivers have excessive gain on these lower frequencies and really ought to be operated with preamps off with some attenuation if you

expect the infernal S-meter to retain any relevance whatever.

If you have ever had the opportunity to operate a rig running as little as a couple of watts, you will have realised how silly these reports of forty over nine really are. If your 100 watt rig scores forty over nine, then switching to your one or two watt QRP rig should still score twenty over nine. Does it? Try strength five to seven, more like. Why? Because the signal strength meter is very unlikely to be accurate in either outright reading or linear in its graduations.

HF radios, even if their S-meters have been calibrated to a reference, are only going to read that accurate reference level on one band with a specific configuration of bandwidth, mode and front-end setting.

Forget it! Use your ears. Nature has endowed us with incredible capacity for sensitive assessment. What you are doing is determining signal-to-noise ratio, which is what essentially determines whether you hear the other station. Learning to give useful reports in a consistent and scientific manner makes you a useful reference for distant stations as conditions and station engineering change.

While we are talking reports, it is amusing and sometimes frustrating to watch proceedings in a contest when a CW contact is attempted. Tourists to the mode seem quite unaware of the tradition in sending not just a readability and strength report but also a *tone* report. This component is quite anachronistic and ought to be dispensed with, however tradition will create a lot of resistance. When a tourist is cajoled into finding a key and plugging it in, the regulars often receive a report without a tone included. Most of us simply editorialise, since nobody has sent less than a tone report less than a nine for generations!

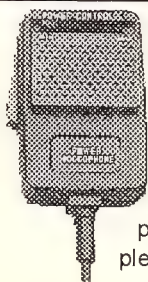
There must be a perplexed look on the face of other contestants during a contest, when our three digit signal report is copied by tyros to CW. At the point where they think they have copied the signal report and are listening for the first digit of the cipher, which indicates how many contacts we have had, the perplexed operator learns that we appear to have had nine hundred and something contacts. Such a blow, their ego throws confusion into the ranks until an explanation takes place on phone.

Thanks for letting me have my five and ninepence worth.

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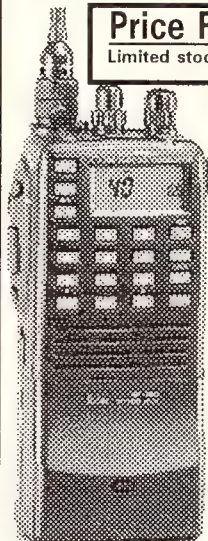
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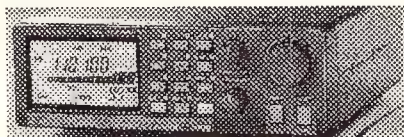
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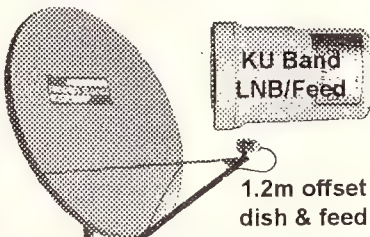
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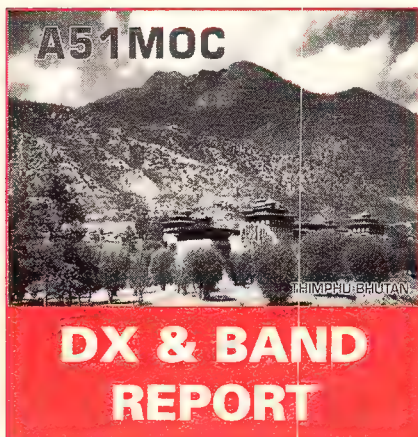
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In my last column — in the very last issue of **Amateur Radio Action** — the operation from Scarborough signing **BS7H** was expected within a few days. And indeed, signing the previous call of **BS7H**, the group appeared more or less on schedule. They were very active over the next few days and certainly seemed to be much easier to work than the previous operation.

I think that most of the **VK/ZL DXers** who tried made the **QSO**. However, in what must be a moment of supreme irony, **ARRL DXCC** released a minimum size ruling a few days later. It seems to me that Scarborough is dead in the water. We shall see...

The basic change to the ruling is as follows: The recommendation adds a minimum size ruling to Point 2 (separation by water) of the Country List Criteria in the **DXCC Rules**.

Add the following paragraphs under **Point 2**:

c) An island is defined as a naturally-formed area of land surrounded by water, the surface of which is above water at high tide. Rocks which cannot sustain human habitation shall not be considered for **DXCC** country status.

d) An island must meet or exceed minimum size standards. To be eligible for consideration, the island must be visible, and named, on a chart with a scale of not less than 1:1,000,000. Charts used must be from recognised national mapping agencies. The island must consist of a single unbroken piece of land not less than 10,000 square feet in area, which is above the water at high tide. The area requirement shall be demonstrated by the chart.

Needless to say, the **DXCC** representative had a hard time at both the Visalia and Dayton HamVentions. However, we the **DXers** will have to wait to see how this ruling affects

Scarborough Reef. I have no idea whether it meets the criteria or not. Time will tell, and if it is not accepted for **DXCC** Country status then there is little problem — we who worked **BS7H** are all in the same boat: we lose a country that we never had anyway.

Stop press

This column was ready for the mail when a fax from **ARRL DXCC** marked for immediate release zoomed out of the machine. To quote:

"The Minimum-Size Rule was dated April 20 and the petition for Scarborough Reef was in the hands of **DXAC** before that date. Therefore, in voting for or against Scarborough, this new ruling will not be applied during deliberations by **DXAC**."

Kermadec, ZL8

As I write this, Barry, **ZS1FJ** is operating from the Kermadec group signing **G4MFW/ZL8** and it is good to hear this very rare location active again. His signal is usually quite weak here, but this has been on 20 metres, which is not the best band for propagation at the moment.

The Ministry of Conservation, the NZ authority concerned, is to be congratulated for its decision to permit this amateur radio operation by Barry during his stay in the area.

QSL Route:

Phyllis Davis, KA1JC,
5282 Boyle Terrace,
Port Charlotte,
Florida 33981,
USA.

Spratly Islands (various calls)

The planned operation signing **DUØK** was cancelled at the last minute due to circumstances beyond the group's control. As we know, our local slim was active on his usual 21 MHz CW slot, so this news confirms his pirate activity. Don't waste money on **QSLing**.

The Spratly Island Group is a very difficult area with many claimants to the various islands. As we know these disputes led to the death of a German radio amateur several years ago.

Nauru, C21

Don't seem to work to many true blue **C21** stations these days. There has been quite a bit of activity by home call/**C21** lately and Ron **ZL1AMO/C21** has been on in the last

few days.

I worked Norman, **C21NJ** on 20 metres SSB, and received a very quick **QSL** card.

QSL Route

Norman Jockane, C21NJ
PO Box 217,
Buada District,
Republic of Nauru,
Central Pacific.

Franz Josef Land, R1

Worked Slava, **R1FJL** from Franz Josef Land on 20 metres SSB at 1030 UTC. It was noticeable that this northerly path was very good over a few days in April.

QSL Route: RW6HS

Svalbard, JW

JW6RHA was very active over a few days and I worked the station at 1240 UTC on 20 metres SSB. At the same time the **LA9** stations and an **OHØ** station were also very strong.

QSL Route: LA6RHA

Cambodia, XU

I previously mentioned that Sanyi, **XU7VK** had permission to use the special callsign **XU95HA** during 1995. But imagine my surprise to hear **XU95HA** on 80 metres CW!

He had a great signal, but it took me three nights to finally get him in the log. He also called me using his usual **XU7VK** call so in a period of a few minutes I had two **XU** QSOs on 80 metres. Needless to say I have already **QSLed** to his manager as this was a new band country. Sanyi has been very consistent at his sun-set time around 1030/1130 UTC but suffers from high **QRN**.

QSL Route: HAØHW

Lebanon, OD5

Worked Nabil, **OD5NA** on 20 metres SSB at 0424 UTC. Nabil is in Beirut and was quite strong here on the long path.

QSL Route: callbook address

Mayotte, FH

Adriano, **IK2GNW** opened up from Mayotte signing **FH/IK2GNW**. He promised plenty of low band activity and was good copy here on both 40 and 80 metres SSB around my sunrise time. I worked him on both bands around 1930 UTC. His signal on 80 metres was very good and many made the **QSO**.

QSL Route: IK2GNW (see note below)

Comoro, D6

After his operation from Mayotte signing FH/K2GNW, Adriano opened up from Comoro signing **D68NW**. Once again, his signals on 40 and 80 metres were very good, and I worked him relatively easily. From Comoro his signal on 80 metres SSB was readable here for a long time after my sunrise, yet the Europeans were not hearing him...

QSL Route:

Adriano Premoselli, IK2GNW
Via Rossini 2,
20080 Cisliano (MI),
Italy.

Special event callsigns

Not sure about you, but I have put many special event callsigns in my log over the last few days. The 50th Anniversary of VE Day of course has been a catalyst, and for my part (being an oldie) the various '50' operations have brought back many memories.

Here are just a few of the calls worked: **US100ITU, UT500UDF, RP3DRO, UX100HW, UR100IY, UT100NT, EO50WL, EO50SU, EO5JN** and more.

Western Sahara, SØ

There has been quite a bit of activity from the Western Sahara area in recent weeks, and I have heard SØRASD on several occasions on 20 metres SSB. I worked him at 2100 UTC on 20 metres SSB — short path of course!

QSL Route: EA2JG

Note: Stations connected with the UN are accepted at DXCC. Eg 4U/KCØPA is valid and active from the Western Sahara, BUT SØ/KCØPA is *not* acceptable for DXCC credit.

Benin, TJ

This is a rare one for many DXers and Sigi, **TY1IJ** is reported to be active although I must confess he has eluded me. Note that he has a change of QSL manager:

QSL Route: DK8ZD (not DJ5IO)

New callsigns from the FCC

Just when you thought you'd had mastered all those new Russian and CIS callsigns we move a bit nearer home...

Alaska: gone are those AL, KL, NL, WL, etc calls with 7 as the figure — well not exactly *gone* but augmented by *any* number between 0 and 9. So one can start looking for KL8AA, NL5AA, and so on.

There is an exception though: the structure KL9KAA to KL9KHZ is reserved for US personnel in Korea. Not sure what you think, but I can see no logic in this part at all.

Hawaii: gone will be that exclusive figure 6 in Hawaiian callsigns. We have all worked our share of KH6s, for example. The FCC has now allocated the figure 7 to Hawaii, so we can expect AH7, NH7, WH7 prefixes. To cater for Kure (don't forget that Kure Island, which was KH7, is now abandoned) the prefix will be followed by a K - eg AH7K, NH7K, WH7K.

Rwanda, 9X

With the UN involvement in Rwanda, this DXCC country has been more readily available in recent times. It was tough for me to listen to **9X/SM5CID** rag-chewing on 80 metres SSB at around S6, complaining about poor band conditions!! To make things worse, he was outside that tiny segment we call a DX Window!!!

Mark, **ON4WW** signing **9X/ON4WW** is a good chance for those needing Rwanda on the low bands. His reported schedule is 2015 UTC on 3515 kHz, and later at 2030 UTC on 1827 kHz. These times are a bit late for me, but certainly possible for VK. Mark is reported as being very active, so he is one to look for.

QSL Route: ON5NT

Heard Island, VKØ

The proposed DXpedition to Heard Island is due to take place in the December 1996/January 1997 time frame. This will coincide with the 50th Anniversary of the establishment of the first Australian Antarctic Base on Heard Island. I know from a discussion with ANARE some time ago they have many things planned for this special anniversary.

It was one of the most moving moments of my life when I first stepped on Heard Island, walked a few yards up the beach, and saw the 'Old Base Camp' for the first time. Quite incredible that the wooden buildings were still there.

We wish ANARE every success with its planning for the 50th Anniversary celebrations.

Kenya, 5Z

Lynn, **5Z4DU** has been around quite a while, but recently he has been very active on 80 metres with very good signals. He is usually in

the DX window, and has more time at the weekends so the VKs should be able to work him at their sunrise times. Lynn is in the Safari business.

QSL Route:

Lynn, **5Z4DU**,
PO Box 21355,
Nairobi,
Kenya,
East Africa.

QSLing — what's new?

As the years pass it becomes more and more apparent that things do not stand still. That stalwart of QSLing, the 'Green Stamp' (the US dollar note) is becoming suspect in many areas — it simply is not enough to have your card returned by Air Mail. Germany's air mail is now in the 300 DM bracket (one DM is almost exactly A\$1 at the moment, so DL mail is far from cheap). Japanese mail charges, to quote another example, have always been pretty expensive, with something like ¥80 the norm for internal mail — and that is a dollar give or take a cent or two.

Also the (quite common) practice of using those tiny envelopes both to forward a card and as an SAE is awkward. In most cases that small envelope is inconvenient for most QSL cards — they may fit your specially-sized cards (folded or otherwise) but not others.

Albania, ZA

For over 40 years ZA, Albania ceased to exist on the amateur radio bands. The other day I received a direct QSL card from a ZA station with SAE and return postage. Made me stop and think for a moment — it made me remember just how lucky we had all been with our 40 years (plus) of open bands.

I hope my QSL card has dropped through his letter box by now. How times change.

In a recent letter Vlado, **Z32KV** gave the following ZA QSL information:

ZA1MH: Z32KV (YU5FCA CBA)
ZA1AJ: OK2PSZ (now OK2ZV)

Macedonia, Z3

Vlado, **Z32KV** also gave some QSL Information on Z3 stations;

Z32JA via Wa4JTK
Z32XA via KM6ON
Z31VP via DJ0LZ

Many thanks Vlado.

....✉

DX & BAND REPORT *(continued...)*

St Paul Island, CY9

St Paul has usually been fairly active over the years, but can be a hard one for us over in this neck of the woods. Good to hear that Murray, **WA4DAN** plans to activate St Paul July 27 to August 2 on all bands 160-6 metres and on all usual modes SSB/CW/RTTY.

Scheduled operators are Ron, **AA4VK**; Murray, **WA4DAN**; Bob, **KW2P** and Vance, **W5IJU**. All travelling arrangements, landing permits and boat charter agreements are in place.

QSL route:

Murray Adams, WA4DAN 403 East 14th Street, Greenville, North Carolina 27858 USA.

North Korea, P5

It is reported that, as you read this, Martti Laine, **OH2BH** will have been to North Korea and it is hoped that he may have some news about the possible start of amateur radio there. Martti goes to North Korea at the invitation of the government.

HQ United Nations, 4U

I remember that some time ago there was considerable flak from DXers about poor QSL for QSOs with **4U1UN**. By all accounts these days have gone with a large batch of QSL cards hitting the mail. QSL cards for **4U5ØUN** will be processed shortly when the cards come from the printer.

QSL Route for 4U1UN: WB8FLO

Crete, SV9

Lots of activity is expected from several HA stations signing **SV9/Home Call/P**.

HAØDU, **HAØHW** and **HAØRT** should have all been active as you read this. They also hoped to air a special call sign **SV9/HGØD/P**.

QSL Route: HAØHW (For all QSOs)

Malawi, 7Q

It is noted that the next assignment for Peter, **ON6TT** is to be Malawi starting late May for one month. Peter has been allocated **7Q7XT** and is usually quite active, so this is a chance to get Malawi if you need it.

QSL Route: info needed

Auckland and Campbell, ZL9

Unfortunately, it appears that in the recent ZL9 operation the majority

of QSOs with Graham, **ZL9GD** took place whilst he was on board the vessel. In discussion with Graham, it appears that this was really a misunderstanding and lack of knowledge of DXCC rules.

Graham has faxed ARRL, DXCC (copy to me) outlining the situation. There is no need to pre-empt the DXCC decision here.

In a letter from **ZL2BDF**, it is reported that the weather station on Campbell Island is to be replaced with a fully-automatic unmanned unit. The facilities themselves will be dismantled. This will make Auckland and Campbell very rare in future, as over the many years there was always a chance that one of the weather team would be a radio amateur.

Peoples' Rep. of China, BY

It is reported that the amateur radio activity from China is still increasing. Chen, **BZ4HAM** reports that some 110 BY club stations and some 120 BZ individual licences are active. Certainly, on a day-to-day basis on the bands, activity from China is usually apparent. Another success story and good news for amateur radio in general.

Tunisia, 3V8

The recent second operation from **3V8BB**, Tunisia has been very elusive. Many of the VK/ZLs DXers are looking for him but no luck. Apparently this operation is by **YT1AD** and he has been reported on 17 and 20 metres SSB and on 80 metres CW.

QSL Route: YT1AD

QSL info: KC6

Jim, **WV5S** can still handle cards for the following:

February 1992: KC6/WV5S, KC6SS, KLC6MM, KC6OO, KC6OK, KC6GG, KC6VV.

November 1993: KC6GG, KC6VV

November 1993: KP2/WV5S

February 1993: KC6OK, N5OK

February 1993: KC6GG, N5GG

February 1993: KC6RR, WØRRY

Conway Reef, 3D2C

The recent operation from Conway Reef certainly had its share of problems courtesy of our old DXpeditioning friend Murphy. Landing accidents due to high swell resulted in the loss of computers, outboard motors and many personal belongings in the name of DXing.

Due to the loss of the computers all logs were kept in paper form.

QSO totals were around 30,000 and a breakdown shows that 15 to 20 per cent of the QSOs were with Europe. Note that Conway Reef was badly wanted by the European DXers.

DX news sheets

A new DX news sheet is reported on the scene. Called **59(9) DX Report**, it was launched at the Dayton HamVention. Produced by Bob, **WB2YQH**, the bulletin is aimed at the newcomers to the DX scene as well as the big guns. If you are interested in this DX News Sheet then write Bob, **WB2YQH** at his callbook address.

RSGB DX News Sheet

In a recent fax Bren, **G4DYO**, Editor of the RSGB DX News Sheet for several years now, announced that he had quit as editor. The problems with the RSGB and production matters have been apparent from time to time, however the decision by Bren is a great pity. I sincerely believe that this particular news sheet is the best in the game bar none.

The effort going into a weekly DX news sheet that carries clout, reflects DX news accurately without personality issues or whatever is, of course, horrendous. Bren has left his mark on the DX scene in no uncertain terms. It remains to be seen who will take over the reins...

So that is about it once again.

In recent weeks I have undertaken an overhaul of the 40 metre vertical array, and developed an idea of directional low-noise 160 metre receiving array. It uses a recent antenna idea called the 'EWE' which first appeared in the February 1995 issue QST in an article by Floyd Kontz, **WA2WVL**. This antenna has great potential on 160 and also on 80 metres, so you can be sure that this simple antenna concept will go places!

To the many who keep me informed on the bands and by fax/telephone many thanks. Your information is always appreciated.

A special thanks is due to the following DX outlets: **QRZ DX**, **RSGB DX News Sheet**, **JA DX News**, **Les Nouvelles DX**, **NJDXA News Letter** and many others.

73 from Jim, **VK9NS**

ISLANDS ON THE AIR (IOTA)

By Jim Smith, VK9NS, PO Box 90,

Norfolk Island, South Pacific 2899

Here is a summary of IOTA activity over the last few weeks. I hope the VK/ZL and Pacific IOTA Hunters managed to work these stations:

AF-007	D68NW	Comoro	QSL IK2GNW
AF-027	FH/IK2GNW	Mayotte	QSL IK2GNW
AF-050	5T0AS/P	Tidra Island	QSL IT9AZS
AF-059	J20SF	Kadda Dabali Island	QSL A47RS. (See info.)
AS-002	A92BE	Bahrein Island	QSL CBA
AS-004	ZC4ESB	Cyprus (UK Sov. Bases)	QSL CBA
AS-005	R3AAA/Ø	Dickson Island	QSL RV3DDZ
AS-008	4S7/HB9BRM	Sri Lanka	QSL HB9BRM
AS-013	8Q7BV	Maldives	QSL HB9DIF
AS-013	8Q7AI	Maldives	DL1IAI. (See info.)
AS-018	RA0FA	Sakhalin Island	QSL Bureau
AS-038	UA0KDS	Ayon Island	QSL Bureau
AS-053	E21AOY/8	Ko Yao Yai Island	QSL DL9MDZ
AS-101	HS8/DF8AN	Samui	QSL DF8AN
AS-116	BS7H	Huang Yan Dao	QSL JA1BK. (See info.)
AS-119	A43GI	El Ghanam	QSL A47RS. (See info.)
EU-002	OH0KMG	Aland Island	QSL Bureau
EU-003	CU3DX	Terceira Island	QSL CU3AN
EU-019	R1FJC	Franz Josef Land	QSL RW6HS
EU-026	JW6RHA	Svalbard	QSL LA6RHA
EU-038	PA/ON4TH/P	Texel Island	QSL ON4TH
EU-048	TM0PR	Ile de Groix	QSL F5JOT
EU-051	IK8BIZ/IE9	Utisca Island	QSL ARI. (See info.)
EU-051	IK8HOX/IE9	Utisca Island	QSL ARI
EU-051	IK8FPI/IE9	Utisca Island	QSL ARI
EU-057	DL4KUM	Rügen Island	QSL CBA or Bureau
EU-061	LA9HW	Hvaler	QSL CBA or Bureau
EU-101	OH6MIL	Vaasa Group	QSL CBA or Bureau
EU-145	CT1ESO/P	Culatra Island	QSL CT1ESO
NA-023	VP2VI	British Virgin Islands	QSL AB1U
NA-033	HK0TCN	San Andres Island	QSL CBA
NA-080	C6AGN	Green Turtle Cay	QSL W1SE
NA-109	J88CD	St Vincent	QSL CBA
NA-137	CJ3NSZ/M	Maine Group	QSL VE3NSZ
NA-022	AI5P/VP2E	Anguilla	QSL AI5P
NA-080	C6AGN	Green Turtle Cay	QSL WS1E
NA-105	AI5P/PJ7	St Martin	QSL AI5P
NA-105	WB5JHK/PJ7	St Martin	QSL WB5JHK
NA-138	KM4WE	Florida Stae West Group	QSL KM4WE
NA-202	HP2CWB/P	Isla Grande	QSL HP2CWB
NA-203	HP9I	Iguana Island	QSL HP2CWB
OC-016	3D2AG	Vanau Levu Island	QSL CBA
OC-017	T30DP	Tarawa	QSL KH6JEB
OC-019	KH6/W4BAA	Hawaii	QSL W4BAA
OC-021	YB1RED	Java Island	QSL CBA
OC-031	C21DJ	Nauru	See QSL info.
OC-034	P29PL	P.N.G.	QSL VK9NS
OC-039	G4MFW/ZL8	Kermadec	QSL KA1JC
OC-042	DU1QKU	Luzon	QSL Bureau
OC-054	FW/JA1WPX	Wallis Island	QSL JA1WPX
OC-086	KH0AC	Saipan Island	QSL CBA
OC-136	VK5VQ	Philip Island	QSL CBA
OC-138	VK4BRE	Thursday Island	QSL CBA
SA-011	9Y4KS	Trinidad Island	QSL CBA
SA-059	YV5ANF/P	Los Frailes	QSL YV5ECY
SA-079	PX0UP	Rasa Island	QSL PY1UP
SA-080	PW6AB	Tinhare Island	QSL PS7AB. (See info.)

QSL Information

/IE9 ARI Naples, PO Box 336, I-80100 Naples, Italy.
8Q7AI DL1IAI, Juergen Filkorn, Fruehlingerstrasse 13, D-68549 Ilvesheim, Germany.
9M0A JA9AG, Ytaka Yoshii, 3-33 Nakataikoyama, Kosugi, Toyama 939-03, Japan
A43GI A47RS, PO Box 981, 113 Muscat, Sultanate of Oman
BS7H JA1BK, Kan Mizoguchi, 5-3, Sakuragaoka 4 Chome, Tama-City, Tokyo 206, Japan.
C21DJ PO Box 217, Republic of Nauru, Central Pacific.
CO0OTA CT1ESO, Luis Gomes, PO Box 207, 8900 Vila Real de Santo, Antonio, Portugal.
D68QM ON4QM, Marcel Dehonin, Everestr 130, B-1932 Sint Stevens Woluwe, BT Belgium.
E21AOY/8 DL9MDZ, Robert Geschwindtner, Georg-Holzmueller Strasse 12, D-82288, Kottgeisering, Germany.
HH6JH Rev John Henault, OMI, Lynx Air, Box 407139 Ft Lauderdale, FL 33340 USA.
J20SF F5LBM, Patrick LaBeaume, 38 Chemin du Plateau, F-67500 Haguenau, France.
PW6AB PS7AB, Ronaldo Bastos Reis, PO Box 2021, Natal, RN, 59094-970, Brazil.
R0/UR8LV PO Box 32, Dickson Island 663241, Republic of Russia.
V73C N4GAK, Bruce Smith, 15 Henderson Street, Fayetteville, TN 37334, USA.

AS-042 Operation by RW3TT/Ø. The QSL manager DL8AAM is still waiting for the logs for this operation, so please do not re-QSL.

IOTA Activity

The following IOTA activity is scheduled to take place.

NA-??? CO0OTA The Archipelago of Sabana should be a new IOTA number for a scheduled Cuban IOTA DXpedition during late May. Dates of the operation are the 25th May to 29th May. Operators include CO2QQ, CO6CG, CO7KR, CT1EEB, CT1ESO, EA5BYP, EA5YN, 18IYW, I0SNY. QSL CT1ESO - SEE QSL INFO. NOTE: AS-088 A70X AI-Ishat Island. The recent operation is now okay for IOTA Credit as documentation has been received.

Russia

An IOTA HAMVENTION was scheduled to take place in Lipetsk in mid May (sorry but I have just received this information)

It is interesting the read that the idea is to popularize the IOTA Programme in Russia. Of course Russia has many entries in the IOTA Directory, the aims of the convention are;

To present the Best IOTA DXpedition 1994. To present the Best IOTA DXpedition 1994 in Russia. To make the IOTA Directory available to Russian IOTA Hunters.

In addition several video tape presentations of IOTA DXpeditions are promised. It is hoped that this IOTA HAMVENTION will be an annual event. Sponsors are the Russian Robinson Club.

IOTA Bologna convention

I have received an invitation from A.R.I to attend the IOTA Convention to be held in Bologna, Italy in October. It will be very nice to meet the IOTA Hunters and of course DXers.

So that is the IOTA information for this month. I would like to thank several VK stations who have written to me regarding IOTA islands possible activity and so on. It is good to see interest building up in the area. Your comments are appreciated.

Until next time Happy Island Hunting. 73 Jim, VK9NS

Have you ever tuned off the beaten track? Maybe you're already off the beaten track in the 'utility' sections of shortwave? Have you bumped into strange stations sending groups of numbers or letters in Spanish, English, Russian or German?

If the answer is yes, you've heard a **numbers** station!

They've been around since the early 1960s, and they're still in abundance today.

Various theories have been put forward as to their purpose including:

weather forecasts, shipping information and even a secret project communicating with UFOs!

But it soon became clear what the transmissions were for — they are messages from Intelligence Organisations throughout the world, to their agents in the field.

This has been confirmed by dedicated monitors who have tracked the transmission sites down and also by agents who have described how their masters communicated orders to them.

Despite this overwhelming evidence, people are still sceptical.

Most commonly, they ask why shortwave radio should be used to transmit these messages in today's high-tech world of satellites and digital communication! But what could be simpler and more innocuous than listening to a shortwave radio?

Perhaps because of the slight unease as to the purpose of these stations, people have been reluctant to speak about them in the past.

Listed towards the end of this short article are some books and magazines which will assist you in chasing the elusive 'numbers stations'.

Even so, this part of the shortwave listening hobby remains somewhat in the 'underground'.

Where can I find them?

The answer is anywhere from as low as 2MHz to as high as 26MHz. Stations transmit messages in Morse Code (CW) and voice using both AM and SSB. In the US, Spanish predominates, but in Europe, English, Russian and German are the main languages.

However, there are transmissions that can be heard in Chinese, French, Serbo-Croat, Hebrew, Rumanian and even Yiddish!

When can I find them?

Anytime! There are stations with regular schedules that appear all day, all year 'round and who don't even stop for public holidays.

Now for some really, seriously spooky stuff...

NUMBERS STATIONS — WHAT ARE THEY?

By Mike Chace (mikec@praxis.co.uk)

The schedule for the CIA's Counting Stations.

These are so-called because of the sign-on in which a female voice counts from One to Zero, repeats the Agent number (eg 005) three times and counts again. This cycle repeats for ten minutes, at which ten slow tones are sent, followed by 'count' and the numbers of groups that are to be sent.

Message groups can be four or five numbers or 3+2 'dictionary coded' which are sent as "123 (pause) 45".

Apart from these message transmissions, there are a number of 'control' transmissions which just repeat a small set of four-figure numbers for five minutes. It is believed that these transmissions are status messages. All traffic is sent in AM.

Messages can be sent in Spanish, English and German.

DAILY CONTROL SCHEDULE

Time (UTC)	Frequencies (kHz)
0030	7451 and 5205

0130	7763
0630	9224 and 5205
0730	13,581 and 16,451
1330	16,434 and 13,423
1330	8560 and 11,440
1730	5205, 8556 and 5205

MESSAGE SCHEDULE

Time (UTC)	Day	Frequencies (kHz)
1200	Sun	13,555, 16,086
1400	Sun	12,110, 12,168, 10,723
1500	Sun	11,123
1800	Sun	10,346, 12,238
2100	Sun	8010 (German)
2100	Mon	5716, 6797
0000	Tue	5046
2100	Wed	7588, 11,034
2100	Wed	9049, 12,238
1800	Wed	12,238
2100	Thu	5716, 6797
2100	Thu	9049, 12,238
1700	Fri	17,567, 18,726
2100	Fri	7588, 11,034
1300	Sat	10,529, 7547
1400	Sat	20,872, 18,225

THE LINCOLNSHIRE POACHER

And now, a frequency list for MI6's *Lincolnshire Poacher*, which was named after its signature tune — an old English folk song. An English lady sends a five-digit message identifier between each rendition of the tune for 10 minutes after each hour. Transmissions are in Upper Sideband (USB).

It's believed to be operated by MI6 from sites including RAF Akrotiri in Cyprus and aimed towards the Near East. The transmissions are often heavily jammed.

Frequencies (kHz)			Times
Primary	Secondary	Tertiary	
6959	8302	7887	2000 to 0000UTC
6959	8464	9251	2000 to 0000UTC
11,545	12,603	13,375	1600 to 2000UTC
13,375	11,545	14,487	1200 to 1400UTC
14,487	15,682	16,084	1400 to 1600UTC

Other stations are less frequent and have random schedules and can only be caught by guesswork and a little luck. Here are some up-to-date frequency lists and schedules that you can try:

Hopefully this has given you an insight into this fascinating side of the

hobby. Try it out, you might just find it fun! Every little bit of new information helps give vital clues.

Please send your comments or details of stations that you have heard to me...

Mike Chace (mikec@praxis.co.uk)

A frequency list for the Israeli MOSSAD stations.

These can be heard all day sending an identifier like 'Kilo Papa Alpha' and the number '1' means no message will follow, while '2' means that one will. Messages are made up of random five letter groups spoken phonetically eg 'Alpha, X-Ray, Tango, Mike, Oscar'. Transmissions are in AM but with best results obtained in USB (Upper Sideband).

Frequency (kHz)	Call sign	5531	BAY	7760	ULX
2270	JSR	5629	(occasional)	7918	YHF
2957	SYN	5715	SYN, CIO	8127	CIO, MIW
3150	PCD, ART		ZWL	8465	SYN
3270	KPA	5820	(occasional)	8465	CIO
3417	ART	5911	YHF	8641	MIW
3840	YHF		OEM	9130	EZI
4270	PCD	6270	(occasional)	9402	YHF
4360	CIO	6500	ULX	10,125	CIO
4463	FTJ	6745	PCD	10,648	YHF
4560	YHF	6840	CIO, VLB	10,820	VLB
4665	VLB	6912	JSR, EZI	11,565	EZI
4780	KPA, ULX		OEM	12,747	SYN
4880	ULX	7323	(occasional)	12,950	MIW
5091	JSR	7446	???	13,533	EZI
5230	MIW, SYN,	7540	KPA	13,921	CIO
	VLB, CIO	7605	JSR	14,750	CIO
5339	OEM		VLB, SYN,	14,750	MIW
	(occasional)	7613	CIO	17,410	EZI
5437	ART		GPO	19,715	EZI
			(occasional)	20,740	SYN

The frequencies of the German Morse Numbers station DEA47 which sends occasional five figure groups. Otherwise, the station sends its 'marker' of "V V V de DEA47".

DEA47 keeps German office hours (which are 0800 to 1600UTC) and does not appear at the weekends. It is believed to be operated by the BFST from a site in Husum, Schleswig Holstein in northern Germany.

Frequencies (kHz): 12,283 and 13,581

The transmission schedule of the Three Note Oddity.

Probably only audible in Europe and named after its three note signature tune, played for five minutes before a message of five-figure groups is sent. Transmissions are in AM.

Transmission Schedule & Frequency List

		Sunday	Saturday	Friday	Eve
				Morn	
July	1993	5718			
August	1993	5617			
September	1993	5487			
October	1993	4827			
November	1993	4139			
December	1993	3815			
January	1994	4126			
February	1994	4357			
March	1994	4562	5472		
April	1994	4751	6641	4583	
May	1994	5637	7538	4620	
June	1994	6547	7481	6875	5256
July	1994	5718	6853		
August	1994				
September	1994				
October	1994				
November	1994				
December	1994				
Times	Sunday	2210			
(UK local)	Saturday	2115 (was 2200)			
	Friday Morning	0510			
	Friday Evening	2040			DEA47

*** References from this document ***

- [1] <http://itre.uncecs.edu/radio/books.txt>
- [2] <http://itre.uncecs.edu/radio/magazines.txt>
- [3] <http://itre.uncecs.edu/radio/groups.txt>
- [4] <http://itre.uncecs.edu/radio/poacher.txt>
- [5] <http://itre.uncecs.edu/radio/mossad.txt>
- [6] <http://itre.uncecs.edu/radio/counting.txt>
- [7] <http://itre.uncecs.edu/radio/3note.txt>
- [8] <http://itre.uncecs.edu/radio/dea47.txt>
- [9] <http://itre.uncecs.edu/radio/2letter.txt>

NUMBERS STATIONS BIBLIOGRAPHY New & Up-to-Date Books

Intercepting Numbers Stations

Langley Pierce
Interproducts, 1994,
ISBN 0-95197-83-49

Secret Signals — The Euro Numbers Mystery

Simon Mason
Tiare Publishing, 1992,
ISBN 0-936653-28-0

A Guide to Embassy and Espionage Stations By Tom Kneitel

Addresses:

Tiare Publishing, PO Box 493, Lake Geneva, WI 53147, USA

Interproducts, 8 Abbot Street, Perth PH2 0EB, Scotland, UK
Tel and Fax: 0011 44 738 44 1199

Coding and Cypher Systems

Seizing the ENIGMA

Kahn

Souvenir Press

Secret Warfare - The Battle of Code and Cyphers

Burce Norman

David & Charles/Sterling Publishing
ISBN 0-7153-9456-8

Magazines

The following magazines have regular columns or articles about Number Stations. The US magazines are quite open about the subject, but the UK's leading shortwave listener magazine seems reluctant to publish details in full in their 'Off The Record' quarterly column.

Monitoring Times

PO Box 98, Brasstown, NC 28902, USA

Popular Communications

76 North Broadway, Hicksville, NY 11801, USA

The ACE

PO Box 11201, Shawnee Mission, KS 66207, USA

Shortwave Magazine

Arrowsmith Court, Station Approach, Broadstone, Dorset, BH18 8PW, UK

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SHORTWAVE LISTENING

All times are expressed in Co-ordinated Universal Time (UTC or 'z'). Add 10 hours for Eastern Standard Time, 9.5 hours for Central Standard Time, 8 hours for Western Standard Time and 12 hours for New Zealand Standard Time.

A haven for the far right?

Anyone who frequents bulletin board, Compuserve or Internet discussion groups dedicated to the broadcasting scene won't have escaped the endless chatter lately about the controversy surrounding political broadcasts on the various US private stations, sponsored for the most part by ultra-conservative groups and individuals.

Much of the attention has been directed at shortwave in particular, home of such stations as **WWCR** in Nashville, **WRNO** (New Orleans) and **WINB** (Red Lion, Pennsylvania), all of which rent airtime to virtually any group that can produce the necessary cash. Backlash over the recent Oklahoma City bombing by right wing extremists, however, has put these operations under the microscope, and has reportedly even lead to an investigation by the FCC (Federal Communications Commission) into WWCR's programming policy.

Prior to 1980, except for a handful of Christian stations such as **KGEI**, **WYFR** and **WINB**, shortwave in the US had almost exclusively been the domain of government sector broadcasting. All that changed when a New Orleans millionaire and broadcaster, Joseph Costello, sought and obtained a license to operate the United States' first commercial HF station. Despite a few trials and tribulations experienced by the fledgling **WRNO**, others sought to emulate its path, and later years saw the establishment of such stations as **KNLS** (Alaska), **WMLK** (Bethel), **KVOH** (Los Angeles), **KTBN** (Salt Lake City) and

WHRI (Indiana), all of which are operated by various Christian denominations.

The loophole in US law which allowed the issue of shortwave licenses didn't ostensibly permit broadcasts to a domestic audience; however a station transmitting towards Canada or even Europe will of course also be heard by listeners closer at hand, and today many of these broadcasters make no secret of the fact that their primary goal is to cover the continental United States, even announcing local time in many instances.

Lack of commercial viability has meant that some stations have found it necessary to make airtime available to paying customers, who have ranged from back-yard evangelists to Cuban exiles. Especially prominent have been conservative-leaning preachers such as **Brother Stair**, whose 'Overcomer Ministry' programs feature on both WWCR and WRNO, and **Pastor Pete Peters**, who also enjoys a high profile.

Other personalities of the same ilk include the opinionated but popular talk show host, **Rush Limbaugh**, and a whole assortment of other folk ranging right through to neo-Nazi and right-wing militia sympathisers.

Events such as the Oklahoma City disaster have caused the public to take a long hard look at programming content on the various US shortwave stations, though there is a fine line between basic freedom of speech and downright incitement. Not surprisingly, the broadcasters involved have had to go through their own process of self-examination on this issue, and already WWCR has dropped a program known as 'The Intelligence Report', hosted by one **Mark Koernke**, due to the 'unsuitability' of its editorial content.

Still, while there is an audience for this type of material, there will always be a medium available for its propagation, whether it be short-wave, satellite, medium wave or FM. Such is the prevalence of extremist programming in the US that the UN-sponsored **Radio For Peace International** (Costa Rica) has a regular program called 'The Far Right Radio Review', which explores some of these broadcasts in depth.

A few are somewhat to the right of Genghis Khan and have no equivalent on the airwaves in this country as yet; tuning in would have little

more than novelty value to most of us, but is a useful exercise in gaining an insight into the thinking of a portion of our friends across the Pacific. All this confirms the view that not all programming available on short-wave is wholesome...

Finland

Radio Finland in Helsinki has been kind enough to send along its latest frequency schedule, which includes English at the following times:

To Europe

0645-0700z 11,755, 9560, 6120 kHz
1900-1930z 15,440, 9730, 6120 kHz
2130-2200z 15,440, 11,755, 9730, 6120 kHz

To North America

1130-1200z 15,400, 11,900 kHz (Mon-Fri)
1230-1300z 15,400, 11,900 kHz (Mon-Sat)
1530-1600z 15,400, 11,900 kHz

To Australia and South Asia

0800-0830z 17,820, 15,115 kHz
2230-2300z 9665 kHz

To South America

2230-2300z 11,845, 9650 kHz

To the Middle East and East Africa

0430-0500z 15,440 kHz

A news roundup in Classical Latin beamed for Australian listeners is included on Sundays at 0823z during the regular English broadcast. Just prior to this is a Finnish language course, 'Suomea Suomeski', for which a text book is available.

Botswana

The **Voice of America's** (amended) 'Z95' schedule shows usage of the relay base at Moepeng Hill in Botswana as follows:

5980 kHz: 0300-0430z English
6080 kHz: 0430-0500z Portuguese
7265 kHz: 0300-0500z English
7280 kHz: 0300-0500z English
7340 kHz: 0300-0430z English, 1830-2030z French, 2030-2100z Hausa (Mon-Fri), French (Sat/Sun), 2100-2130z French (Mon-Fri), 2200-2230z English (Mon-Fri)
7375 kHz: 1900-2130z English, 2130-2200z English (Sun-Fri), 2200-2230z English (Mon-Fri)
7415 kHz: 0430-0500z Portuguese,

0500-0530z Hausa, 1900-2130z English, 2130-2200z English (Sun-Fri), 2200-2230z English (Mon-Fri)
9615 kHz: 1800-1900z Amharic
9630 kHz: 0500-0630z English, 0630-0700z English (Sat/Sun)

DX news from Ecuador

Station **HCJB's** popular 'DX Partyline' is now broadcast Saturday at the following times:

To the **South Pacific** at 0909z on 6135 kHz, 21,455 kHz USB
 To **Europe** at 0739z on 11,615 kHz, 1709z on 15,490 kHz, 21,455 kHz USB
 To **North America** at 0109z (Sunday) on 9745 kHz, 15,540 & 21,455 kHz USB and at 0509z (Sunday) on 9745 kHz, 21,455 kHz USB

'The Latest Catch' is HCJB's mid-week update to the DX Partyline. It is broadcast on Wednesdays:

To the **South Pacific** at 1030z on 6135 kHz, 15,540 & 21,455 kHz USB
 To **Europe** at 0700z on 11,615 kHz, 1800z on 15,490 kHz, 15,540 & 21,455 kHz USB
 To **North America** at 0200z (Thursday) on 9745 kHz, 15,540 & 21,455 kHz USB and at 0600z (Thursday) on 9745 kHz, 21,455 kHz USB

RFPI frequencies

Radio For Peace International in Costa Rica advises this schedule:

6.200 kHz (USB) 1200-2200z
7.385 kHz 2200-0800z
9.400 kHz (USB) 24 HOURS
15.050 kHz 1200-0000z

Programming is primarily in English and Spanish.

More from Ecuador

Able to boast only a modest 281,000 square kilometres and a population less than nine million, the Republic of Ecuador is one of South America's most enchanting nations, ranging from lush tropical rainforest to snow-capped Andean peaks such as Cotopaxi and Chimborazo.

Its people are a mix of Quechua Indians, Mestizos and white descendants of Spanish colonialists, a feature reflected in a diverse broadcasting scene, which happily includes a few shortwave stations that can be heard in the Pacific region.

Power supply restrictions have kept some of these broadcasters off

the air for extended periods, however the higher frequencies still remain attractive for organisations wishing to reach remote communities by radio, as well as adjoining countries such as Peru and Colombia.

July is a good month to try one's hand at DXing Ecuador, and the following stations should provide a relatively easy introduction:

3220 kHz: HCJB, Quito. This is the domestic service of the well-known international Christian broadcaster, usually audible mixing with Papua New Guinea's Radio Morobe, co-channel.

3280 kHz: La Voz del Napo, Tena. This up-country sounding station is regularly heard in eastern Australia, though sometimes mixing with a Chinese regional broadcaster.

4870 kHz: La Voz del Upano, Macas. Roman Catholicism is the major religion in these parts, so it is no surprise that the church is prominent in the local media. The transmitter on this frequency was formerly used by **Radio Rio Amazonas**.

4920 kHz: Radio Quito. This station, named after Ecuador's capital city, was once a difficult catch here due to dominance of the frequency by ABC Brisbane, but when active is now a much easier proposition.

4950 kHz: Radio Baha'i, Otavalo. Heard quite a bit this year from its 0900z sign-on, this one is also off air for weeks at a time on occasion.

5010 kHz: Escuelas Radiofonicas Populares, Riobamba. Quite a flash name, and often a creditable signal, as early as 0800z. Many years ago this one operated on 3985 kHz, one of the very few Latin American operations on the 75 metre band.

5040 kHz: La Voz del Upano. Another outlet for this Catholic station.

5050 kHz: Radio Jesus del Gran Poder, Quito. Perhaps the strongest of the tropical band Ecuadorians, sign-on prior to 1000z nightly. The title gives away the program format.

5062 kHz: Sistema Emisora Progreso, Loja. Active over many years, but rarely a strong signal.

Generally, the best time to hear all the above is from 1000-1200z.

Many others come and go from time to time, depending on the health of their equipment and bank balances. Investigations by HCJB's

....

SHORTWAVE LISTENING (continued...)

New WRMI schedule

Jeff White has forwarded this latest schedule for **WRMI** in Miami. All broadcasts go out on 9955 kHz.

DAYS	TIME	PROGRAM	LANGUAGE
Mon-Fri	1100-1400z	La Voz de la Fundacion	Spanish
Mon-Fri	2030-2100z	Viva Miami!	English
Mon-Fri	2100-2300z	Radyo 16 Desanm	Creole
Mon-Fri	2300-2330z	Viva Miami!	English
Mon-Fri	2330-0000z	Viva Miami!	Spanish
Tues-Sat	0000-0030z	Viva Miami!	English
Tues-Sat	0030-0100z	Viva Miami!	Spanish
Tues-Sat	0100-0400z	La Voz de la Fundacion	Spanish
Saturday	1100-1400z	La Voz de la Fundacion	Spanish
Saturday	1700-2100z	Overcomer Ministry	Eng/Span
Saturday	2100-2130z	Viva Miami!	English
Saturday	2130-2200z	Viva Miami!	Spanish
Saturday	2200-2215z	Wavescan	English
Saturday	2215-2230z	Way of the Cross	English
Saturday	2230-2300z	Viva Miami!	English
Saturday	2300-2330z	Brother Ed	English
Saturday	2330-2345z	Gospel of Deliverance	English
Saturday	2345-0000z	Wavescan	English
Sunday	0000-0030z	Viva Miami!	Spanish
Sunday	0030-0045z	La Voz de la Juventud Evangelica	Spanish
Sunday	0045-0100z	Escrito Esta	Spanish
Sunday	0100-0400z	La Voz de la Fundacion	Spanish
Sunday	1100-1130z	Palabras de Vida	Spanish
Sunday	1130-1145z	Wavescan	English
Sunday	1145-1200z	Hope for Today	English
Sunday	1200-1215z	Abundant Life Broadcast	English
Sunday	1215-1230z	Spirit of Truth	English
Sunday	1230-1245z	Scripture Hour	English
Sunday	1245-1300z	Your Church of the Air	English
Sunday	1300-1315z	Search for Truth	English
Sunday	1315-1330z	Redemption Hour	English
Sunday	1330-1400z	Viva Miami!	English
Sunday	1700-2100z	Overcomer Ministry	Eng/Span
Sunday	2100-2130z	Contacto con Cuba	Spanish
Sunday	2130-2200z	Viva Miami!	Spanish
Sunday	2200-2230z	Viva Miami!	English
Sunday	2230-2300z	Viva Miami!	Spanish
Sunday	2300-2330z	Viva Miami!	Spanish
Sunday	2330-0000z	Vida Universal	Spanish
Monday	0000-0015z	Wavescan	English
Monday	0015-0030z	Truth for the World	English
Monday	0030-0045z	Voice of Deliverance and Power	English
Monday	0045-0100z	Baptist Bible Broadcast	English

Viva Miami! is WRMI's own production, presented in both English and Spanish. Jeff White hosts this magazine-style program, which includes information, interviews and entertainment from and about Miami and the State of Florida. It also includes Latin music, international travel features, 'DX' information for shortwave enthusiasts, and letters from WRMI listeners around the world. Viva Miami! is generally broadcast live at 0000-0100 UTC Tuesday-Saturday, while the other editions are repeats of recent programs.

Radyo 16 Desanm is the official shortwave broadcasting service of the Government of Haiti. It transmits news and information in the Haitian Creole language to Haiti itself and to Haitians abroad. The two-hour broadcasts from 2100-2300 UTC Monday-Friday originate live in Port-au-Prince. Shortwave listeners who do not speak Creole may find 'Radyo 16 Desanm' interesting for the Haitian music which it frequently broadcasts.

Winter is generally the best time of year for listeners in Australia and New Zealand to hear WRMI, particularly for the 1100z transmission block.

Richard McVicar have yielded some signalling of intentions by a few other broadcasters:

- **Radio Oriental**, Tena (4780 kHz). Off-air due to an unexplained fire in 1994. New equipment has arrived in the country, and a return is imminent.

- **Radio Cumanda**, Coca (3350 kHz). Hopes to return to shortwave soon, by virtue of some new equipment.

- **Radio Interoceania**, Santa Rosa (4840 kHz). Transmitter problems, and no money.

- **Emisora Gran Colombia**, Quito (4911 kHz). Recently moved studios, and could return any time.

- **Radio Municipal**, Quito. A two kW transmitter is ready for operation, and this new station should start on 4750 kHz when license formalities are out of the way.

- **Radio Popular Independiente**, Cuenca (4800 kHz). Only on for a few hours per day due to electricity rationing.

In addition to Spanish programming, look for a modicum of Quechua language segments from most Ecuadorians, particularly from broadcasters situated outside the Capital. It should also be remembered that the Galapagos Islands are also part of Ecuador, but it is some years since the shortwave outlet

on Isla San Cristobal was active.

News in brief

• **BBC World Service** reports that the foundation stone for its new relay base in Thailand has been laid in a recent ceremony. Due to come on line in 1997, the facility will ultimately replace the present relay in Hong Kong (which, of course, is due to revert to China in 1997), and also supplement coverage from Kranji (Singapore).

In other BBC happenings, many people will be aware already that the BBC now has different 'streams' of its World Service, on a regionalised basis. This appears to have been a less than popular move, and in a couple of instances the BBC interferes with itself, due to different programs being broadcast on the same frequencies from more than one site. Some frequency details to come, when I can decipher the latest available schedule information.

• **Radio Piranha International** is a pirate station which has recently been conducting test transmissions, somewhat optimistically, towards Australia and New Zealand on 13,950 kHz (LSB).

According to a 'World of Radio' report, these have been during June from 0500-0700z (Sundays), but may be extended further if propagation is satisfactory. Another time to try is 1900-2100z (again, Sundays), when the target area is North and South America.

• An interesting new frequency for **KVOH** in Los Angeles is 9975 kHz, noted by the writer just after 1000z with Portuguese programming. This appears to be a replacement for 9785 kHz and is yet another band-edge occupancy for a US station.

• Relays of the **Voice of America** via **Radio Liberty/Radio Free Europe's** Biblis site are now listed: 1700-1730z Slovak, 1800-2000z English both on 3980 kHz; 0300-0330z Bulgarian, 0330-0400z Czech, 0400-0700z English, all on 3985 kHz. All programs are beamed to Europe, with 100 kW output.

• In '**Shortwave News**', Wolfgang Buschel of Germany reports that the external service of the **Cyprus Broadcasting Corporation** in Nicosia is now using 6180, 7205 and 9760 kHz 2210-2245z. Programming is in Greek and goes out only on Friday, Saturday and Sunday, using facilities made available by the BBC at Limassol.

• The **Central** station from Vientiane, Laos, has been making some rare (local) morning appearances of late on 6130 kHz. A tuning signal comes on at 2155z, followed by the national anthem and announcements in Laotian just prior to 2200z. Vientiane is more commonly heard here in our evenings, around 1200z, and morning reception is an annual winter feature.

Mongolia

The folk in Ulan Bator sure have some unconventional frequency management practices! Witness, for example, some of the oddball channels listed in **RUB's** latest English schedule:

0300-0330z 12,000, 9960 kHz to North America

0910-0940z 12,000, 9960 kHz to Australia

1445-1515z 9950, 7290 kHz (measured at 7293 kHz) to South Asia

1930-2000z 7530, 4080 kHz to Europe

Note that 4080 kHz is used at other times by the domestic service.

Russia

Schedules from the various Russian stations are now starting to appear with greater regularity — this one from **Chitinskaya Radio**, received by Jerry Berg and published in DSWCI 'Shortwave News', is certainly of interest and covers local programming:

Saturday 0010-0100, 0110-0200, 2210-2300 & 2320-2400z;

Sunday 0010-0200, 2110-2200 & 2210-2300z;

Monday/Tuesday/Thursday 1010-1100z, 1120-1200, 2110-2200 & 2210-2300z;

Wednesday 1010-1100, 1120-1200, 1210-1300, 2110-2200 & 2210-2300z;

Friday 1010-1100, 1120-1200, 1210-1300, 2210-2300 & 2320-0000z.

The frequency for all of these transmissions is 4860 kHz, and all programming is in Russian from a 100 kW transmitter designated 'PB-438'. To save you reaching for the reference sources, Chitinskaya Radio broadcasts from the City of Chita, just to the north of the Mongolian border. Quite an easy catch in the Pacific, during our late evenings.

Good listening until next month.

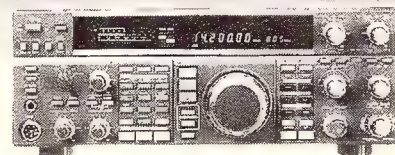
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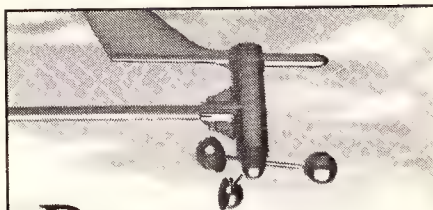
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As we move into the early half of the '40s it is good to see that manufacturers are getting the message and producing what we, the radio amateurs, really want. After my last review of that powerful Air Ministry combo, the R1155/T1154, I was a bit miffed over letters to the editor. "Not another review!", was one comment — huh, we can never have too much of a good thing.

Many radio amateurs say that governments should not be competing in the commercial market. Well, they do have a captive market at the moment, as we are all still 'off the air'.

The **SPAM-B2** is the latest all-singing, all-dancing TX/RX rig from the stables of the Ministry of Defence. **Super Production Amateur Military** (Ltd) has done it again. This B2 model recently released by MOD is marketed under that greatly improved ARROW Logo. We know this logo stands for no expenses spared (then some) **QUALITY**.

The review SPAM-B2 arrived in a substantial wooden crate. A mere three hours later I finally got the combo assembled on the bench. Well, in the bedroom actually, I reserve the garage/workshop for the bigger 5kW AM transmitters...

By the way, the Ministry is really crafty — not a sign of the ARROW on the outside of the crate — just SPAM. This four-letter word is a pseudonym for some American food product being off-loaded in Blighty these days. Nobody would ever think there was a complete TX/RX in the crate. The thought of having to open it to check would deter anyone...

Over the next couple of days I went over the equipment very carefully as we all do when we get a brand new rig. The manual in one hand and a steady plod through the controls is the way to go. It would be madness just to plug it in and switch on...

The manual, you ask? It is highly detailed with adequate instructions on

Jim Smith (behind the lines in France) reviews the...

ULTRA-SECRET SPAM B2

Is this the radio you've been waiting for...?

everything you need to know. Someone must be making a packet, though. Where do they get all these new fangled names from? Superheterodyne, Triode Hexode Multiplicative Frequency Changer, High-Power Beam Tetrode valve, Dynamically-engineered black metal valve cover for better heat dissipation, and all that. If only I could think along these lines I would apply for the job tout de suite. (That, of course, is French for PDQ.)

Checks on the transmitter shows that it easily produces 20 watts of RF power on all design frequencies from 3 to 16 MHz.

The CW has that unique crystal quality which we expect from a crystal oscillator.

A major gripe here is this: why do manufacturers only supply one useless frequency with these transmitters? What crystal manufacturer is in the know so that it can dump its unwanted, unused crystal stock on MOD?

The crystal pack with the review SPAM-B2 was a typical example... useless except for testing.

It was labelled **Top Secret, Channel 10X — France/Blighty**.

It is pointed out here that all transmitter checks, tuning up tests and the like were done on a non-radiating dummy load. This is a standard practice of mine in any case.

I didn't really need that MOD reminder in red — 20 years in jail, bread and water, and all that.

The transmitter handles really well. I like the exposed PA coil and I found that the RF burns received during TX tune-up were a great help in waking up. 'Hands on' tuning at its finest... In a major change of policy and a break-away from the thinking of those *other* manufacturers, the transmitter actually has an output circuit one can tune.

Are you tired of these skimpy 50 ohm O/P rigs? Ever tried to feed a wire fence with one?? No, this B2 has a PI output circuit (this is another of these word things — I think PI is a Greek letter but its con-

nection with a TX output circuit escapes me).

Anyway, this circuit is guaranteed to put power into anything. That red MOD writing stopped me proving this point, by the way. I wanted to try it on that bit of wet string I have in the back yard.

The manual says the receiver is a four valve superheterodyne — well I suppose they should know.

It covers 3 to 16MHz in three switch ranges. The low IF of around 470 kHz ensures image reception is excellent on the higher frequencies. Good thinking this — two for the price of one in a way. Sensitivity is an incredible 3-5 μ V for 10dB S/N.

The receiver tuning is immediately responsive — in fact, the slightest touch on the dial really get things moving. I also found that by banging the operating table I could move the receiver's frequency very easily.

Do this when the wife is not asleep, otherwise problems can arise...

The receiver is also equipped with that latest innovation, 'the slow motion dial'. A great idea this — the same sort of touch (mentioned previously) moves the frequency less and a bit slower. The front panel is clean with the minimum of controls.

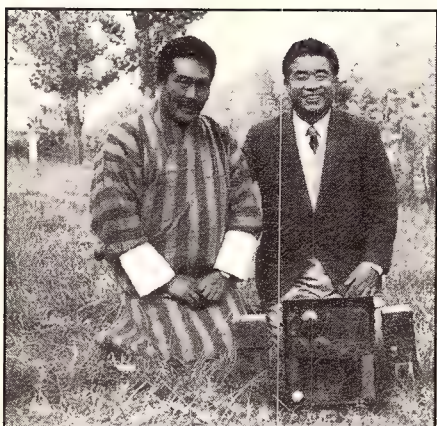
Hang on a minute — it's the phone — no mistaking that three-minute one-ringer from the local exchange!

What a turn up for the books, that was MOD on the line. They have requested *me*, yours truly (the guy jokingly said something about "this is an order...") that I take the SPAM-B2 on a field trial somewhere in France.

They actually want me to check whether I can communicate with Blighty. They also mentioned something about National Security, Behind Enemy Lines, Defence Strategy and all that nationalistic stuff.

Okay, I hear you out there, "not *another* all-expenses-paid trip?". Another DXpedition? Well there is only one answer to that sort of talk. "Who needs France?"

I had 24 hours to get to a well-known RAF station down south to pick up a scheduled flight. This is the weekly



A lot of wartime equipment like this old SPAM-B2 wound up in private hands after the war. This one was photographed by Jim while on a trip to Bhutan — still performing well!

'Behind the lines dropper flight' BLDF as it is affectionately called locally. I just could not face re-packing that SPAM-B2 into its crate. I had this sudden brainwave — you know how this happens to everyone occasionally?

I put the assembled B2 into an old suitcase I had under the stairs. It wasn't a perfect fit — in fact, there was a bit of room to spare.

This was handy for a couple of pairs of socks, underpants and my chocolate ration for good measure.

The field trials were something else. It really felt scary with the enemy all around.

We had arrived over southern France a bit too noisily for my liking but the drop itself went well. I expected that the enemy would want to get in this review so I was prepared. I have to get a move on as I have a sked in an hour — with Blighty would you believe?

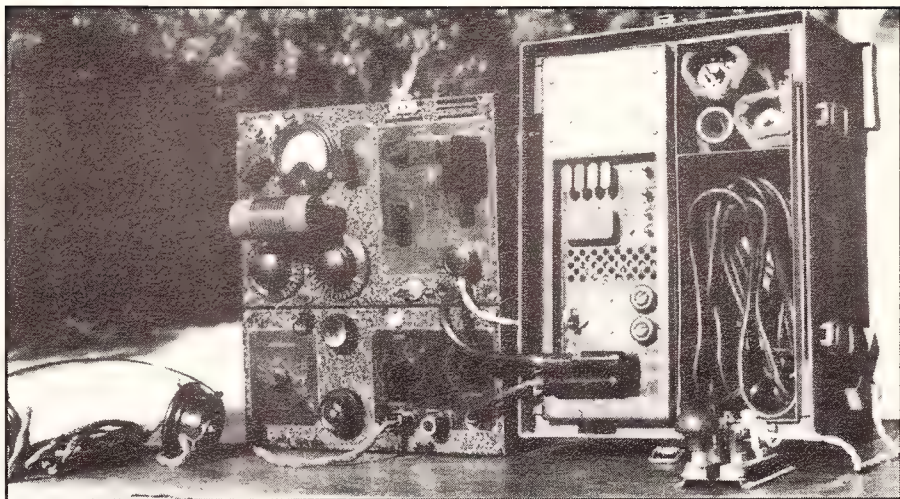
The B2 was set up very easily... my training at home really helped. I used an old tractor battery filched from a nearby farm for power, and the aerial was the next task. (I don't want to get into that aerial/antenna argument — an 'antenna' is an Americanism if ever I've heard one.) To toss the aerial wire over a nearby tree branch I used one of my issue 'self protection' hand grenades as a weight. A couple of simple tips here — make sure you tape the pin and lever securely before attaching wire to that handy ring. Toss or throw (grenades are usually tossed) over the tree... and bingo, there you are. Yes, I know that pin is almost impossible to pull out when you really need to, but Murphy strikes. Take good advice when you get it.

The other end is attached to the AERIAL terminal of the transmitter. MOD get a bit complicated in the manual with a very elaborate mathematical formula $234/F$ feet for the length of aerial wire needed. I skipped that part — a bit hard I thought. The equipment needs a good EARTH connection (and for any reference to GROUND see my previous notes — no arguments please).

Incidentally, tuning up that transmitter behind enemy lines teaches you one thing never to be forgotten. The longer one takes to tune up, the longer the enemy have to take a fix and lob a mortar shell over your way.

Oh! Its sked time, so hang on...

I've just back-tuned the receiver to the TX frequency. That's another crafty idea, transmitter and receiver on the same frequency — all rigs should have this! This B2 is really magic — the sked with Blighty went very well. These CW ops at home are a great bunch, you know. What is your name? What is the serial number of your Morse key? Where are you? Is the food good and how about the French



birds? It took some time to get all these things answered but I did my best to give the info requested. Had a bit of time left to send a super important telegram some French-speaking farm hand gave me.

My French is lousy (except for *tout de suite*) but it was something about help, we are surrounded, need assistance (handy that, they use the same word as we do), co-ordinates follow. Don't know about you but I have never been much good with figures in Morse Code. Anyway, they will never know the difference, hence *viva la difference!!*

Have to run, folks. I thought I heard a bit of traffic around these woods — it could be THEM.

There was a bit of a hassle on packing up when I gave the aerial wire a sharp tug. Gee, they just don't make tape like they used to, this wartime stuff is rubbish. The bang was pretty loud, out of this world in fact...

I hear someone screaming my name — oh, it's the missus. "Wake up, you fool, there is someone on the phone, MAD, MOD or MID not sure who..."

FINI (French for the end)

This light-hearted review is in no way meant to denigrate the thousands of radio amateurs who, because of their unique communications skills, became operators in military service. On land, sea and air they gave their best in some truly diabolical situations.

The B2 was a remarkable unit being complete — except for the actual power source, although even 6V batteries were supplied with later units. Headset, Morse key, spares, TX coils and the like were all provided. The power supply worked all the way from very low DC voltage input up to high AC voltage input.

There was a tap or a switch setting to suit. The TX could and did put power into almost anything — these were the days before the obsession with SWR. That tuneable PI coupler was a winner — in

fact, it became a standard in most post-war rigs.

I first met the B2 in 1947. I was on Car Nicobar in the Indian Ocean in those days. The Suitcase Radio, as it was called, became my first ever commercial rig. It was the days of military surplus, with some great modifications to get gear on the air. In my view the radio amateur was the better for it, due to the skills the situation helped to develop.

A special thanks is due to Robin, VK6LK who several years ago kindly sent me some great photographs of his almost immaculate but well-used B2 station.

His long letter of discussion on modifications undertaken on his outfit brought back many memories.

In Singapore in the late '40s, the so-called Thieves Market was the place to be. A treasure trove of war surplus including American, British and Japanese radio and other equipment. The Japanese already had a beam tetrode which outperformed the very popular 807 or the Metal 6L6 (used in the B2). A simple modification soon had this JA valve as a PA and it dramatically lifted performance right up to 10 metres.

Over 50 years down the track, those silver-plated PA tuning and loading capacitors look as good as new.

The old ceramic switches still switch, and so on.

The PU selenium rectifiers never did age very well, but the silicon diode is a great replacement (although maybe not for the purist!).

To those unique few who used the B2 and other clandestine rigs behind the lines in Europe and, of course, the Pacific area, I hope they enjoyed this 'review' article. The B2 left its mark (ouch) on all who came to use it!

To all those operators, you have my deepest respect and the grateful thanks of many for your great efforts.

73 from Jim, VK9NS.

EQUIPMENT (RE)EVALUATION.....

TAKE A LOOK AT PACKET RADIO...

Welcome to *Here and There in Amateur Radio*, in this first edition of **RADIO AND COMMUNICATIONS**. This is a regular column in which we try to reflect some of the current issues, talking points and trends in amateur radio. Although it is written by one person — **VK3DBP** — *Here and There* aims to give much more than just one person's view. It relies on contact with active radio enthusiasts in Australia and elsewhere, through the medium of amateur radio itself or by mail (electronic or conventional), Internet or telephone.

So if you have a favorite topic which you would like to share with your fellow readers, drop us a line and tell us about it. *Here and There* is always on the lookout for interesting computer software, new equipment ideas or accounts of personal experiences with amateur radio. VK3DBP's personal favorites are slow-scan television (SSTV), packet radio in its various guises and anything to do with computers. But don't let that stop you sending in thoughts and ideas about the many other aspects of amateur radio.

One of the main reasons for the existence of amateur radio is to encourage experimentation. This can easily be coupled with practical projects, such as building new circuits and devices or modifying existing ones. *Here and There* is keen to find new projects to present. So if you have a simple but effective building idea, let us know about it. Don't worry if your writing style is not so hot, we can soon clean it up and make it presentable! So how about a letter to *Here and There*?

What's hot in amateur radio?

A really nifty way of getting to grips with the latest issues in amateur radio is to poke around on packet radio and see what the bulletin boards are carrying. And now that the Internet is well and truly with us, we can surf around on the Net, too, to get a flavor of international happenings. For this first *Here and There* in Radio and Communications, then, here is a quick run-down of some of the topics recently being discussed on packet radio.

The nearest packet bulletin board to this QTH is VK3BLW, ably run by Bryan. In the bigger cities, there are usually several systems within simplex range,

which means that they can be reached directly on the two metre amateur band without the radio signal having to hop between digital repeaters (digi-peaters). Our friends in the country may have less choice, but since the packet bulletin boards 'talk' to one another throughout the day and night, each usually carries the full range of messages. Bryan, VK3BLW also posts summaries (digests) of common topics straight from the Internet, so there is plenty to read.

Messages posted on a packet bulletin board can be listed to show, amongst other things, where they came from, where they are aimed and a short title for each one. Below is an extract from a recent listing on VK3BLW:

The 'To' column is very useful or spotting items which are of particular interest. For example, the **KEPS** items

weather, miscellaneous. The biggest problem with KEPS on the bulletin boards is that other amateurs along the way often decide to repeat the bulletin, so several versions of the same information may be listed.

In an area related to KEPS, you can usually find SpaceNews items, listed under **NEWS**. This is a weekly contribution from KD2BD in Wall Township, New Jersey. Of particular interest in this area at the moment is the Russian MIR manned space station, which runs an amateur packet bulletin board system. Here is an extract from SpaceNews, May 22:

"G. Miles Mann, WF1F, reports that the current crew on Mir is getting the hang of the two metre transceiver and the packet radio Personal Mail System. Norman [Thagard] has been answering packet messages as fast as time allows.

"Many amateur radio stations have learned the correct procedure for connecting to the Mir PMS. But unfortunately, there are many others who do not understand the procedure for connection to Mir. The PMS on Mir can only connect to one station at a time, and it only takes one station operating improperly to ruin a whole pass... If you happen to find one of these stations please pass on the correct information or direct them to back issues of SpaceNews or QST."

Further on in the bulletin, there is some information about US astronaut, Norman Thagard, who has joined the two resident Russians, Volodya and Gennady. Norm says:

Msg#	TSLD	Dim	To	@ BBS	From	Date/Time	Title
86746	BS	981	GP	@VKNET	VK4UW	0520/1705	?GP PASSWORD HELP
86745	BS	530	HELP	@WW	VK4KWB	0520/1704	STANDARDc411
86744	BS	1805	SPCL	@ARL	K5ARH	0520/1703	ARLX023 EMF cancer link studies
86743	BX	4114	MODS	@WW	EA7FHR	0520/1702	MODS IC-03AT
86742	BS	1002	TPK	@WW	N5VVB	0520/1701	TPK AND AEA DSP-2232
86741	BS	2721	CNTY	@WW	KN4XP	0520/1700	KN4XP Trip #2
86740	BS	1256	QSL	@WW	VE2KU	0520/1658	Need QSL info...!
86739	BS	1150	ALL	@WW	VE2DKH	0520/1657	ANTIQU
86738	BS	996	TPK	@WW	N5VVB	0520/1656	TPK AND AEA DSP-2232
86737	BS	1185	ALL	@WW	OH1JFD	0520/1655	CQ CQ CQ FROM FINLAND
86734	BS	7605	NEWS	@AMSAT	K5ARH	0520/1644	* SpaceNews 22-May-95 *
86732	BS	11538	KEPS	@AMSAT	FA1TDA	0520/1638	CP K5ARH: 2Line Orbital Elements

refer to Keplerian elements. These are reference data used by avid satellite watchers to predict when their favorite 'birds' will next be over the shack (many, many years ago, Kepler contributed a lot of ideas to the science of orbital mechanics).

KEPS items appear regularly on packet bulletin boards. They are updated regularly at their source and may be grouped into satellite types — amateur,

"Well, I am truly *living* in space this time as opposed to just visiting as on my previous four flights. Not only that, I got to ride on a Russian rocket, something no other American has done. Volodya, Gennady, and I, I believe, will land in a different country and on a different continent from the one from which we launched. I even had to turn in my unused return airline ticket from Moscow to Houston! Delta probably

was disappointed about that...

"The Aurorae (Borealis and Australis) are plasmas which stream toward the Poles. They can be seen and are sometimes studied from space. During my second flight in 1985, we had an experiment involving photography of the Aurorae. They reflect solar activity, and can be indicators of altered ionospheric conditions which do affect radio transmission.

"The first of four planned EVAs took place today. Seemed successful, although some question about the way the solar battery retracted. Only first three sections of the battery were planned to be folded today. Remaining sections should the battery will be re-installed on the KVANT module. I took some good video. Maybe some of it will be shown on the news.

"Thanks, Norm and the MIR 18 crew."

Back at the extract from the VK3BLW bulletins, we can see quite a few items addressed to **ALL**. This is a great way of getting ideas, opinions and information about virtually anything you can imagine, from equipment modifications (**MODS**) to **CQs** ("Seek you" or the amateur's version of "Hello, is there anyone actually out there?"). Internet surfers now go on about their access to people of similar interest but amateurs have been doing it for years!

One interesting CQ comes from scouts in Brazil, operating through Paul, PY3PAZ. The link between amateur radio and scouting comes alive each year when the Jamboree on the Air (**JOTA**) takes place. But even at other times, scout groups make use of amateur radio to talk to one another around the world. In his latest message, PY3PAZ was looking for photographs, cards and so on to exchange.

Other traffic...

Heaps of items were pouring into VK3BLW around the time of writing this column. Some of the topics included:

- Calls for help with finding QSL information...

The term QSL is used as amateur shorthand for acknowledging a contact. It is not always possible to send a QSL directly to another amateur, even if the callsign is known. A cry for help over packet radio often produces the answer.

- Requests for information about radio equipment...

Active amateurs are often experimenters, particularly when propagation is not so good. It would be unusual not to find someone else working in a similar area, so a packet radio appeal often produces results following a request for information about unusual

equipment items or problems that arise in the course of experimentation.

- Propagation predictions and DX information...

Amateur radio signals on the high-frequency (HF) bands rely on the ionosphere to travel around the globe. Knowing how the upper atmosphere is behaving can be very valuable when trying to predict when long-distance or DX 'openings' are likely. Packet radio is often used to spread the news about predictions of good propagation and success with DX through notices such as the regular DX bulletins.

Look for **DXNEWS** and **PROP** or **PROPAG** in the listing. The abbreviation **IPS** may be used sometimes, in reference to IPS Radio and Space Services. This is a division of the federal Australian Department of Administration Services which monitors radio conditions and issues reports and warnings to radio operators.

- Information about contests and special events...

Many amateurs are happy to stay up all night trying to make as many contacts as possible with other insomniac amateurs. These contests are many and varied in duration, areas of the world covered and methods of point-scoring. Packet radio bulletin boards carry details of coming contests.

As well, information is often included on special event stations, which usually operate with their own call-sign, and for relatively short periods. These may mark a significant anniversary, an exhibition or a field day. Collecting special event station QSLs can be a consuming passion in itself.

- File transfers...

Packet radio can be used to transfer computer programs and files other than text files, using special protocols like YAPP (short for Yet Another Packet Protocol!). Sometimes, however, multi-part non-text files are posted as bulletin board items. These are often labelled as **7+** and all the parts must be collected before they are reconstituted into the original file using a special **7+** program.

Here and There can report little on these files, since there is never anyone here with the patience to collect all the parts and put them back together again. One day, perhaps...

- Humor (? — my question mark)...

This is a category studiously avoided by *Here and There* — humor is a very personal thing and usually items under Humor are not funny!

So there we have it — a veritable hive of activity on packet radio bulletin boards. The amount of information flying back and forth suggests very

strongly that there are masses of amateurs out there who are very involved in their favorite pursuit. And they are always ready to enter into discussion on just about any topic you can think of!

We are at a minimum at the moment in the cycle of sun-spot activity, which takes about 11 years or so to complete. This means that the level of activity on the surface of the Sun is relatively low and so the ionosphere is not so effective at helping HF radio waves to get around the place. Our foray into packet radio tells us two things, however: Firstly, if HF propagation is lousy, there is always packet to play with.

And secondly, never despair — HF DX still exists, even in a sun-spot minimum. Even on my modest trap vertical antenna and using a mere 100 watts transmitter output, I talked recently to Janez, S57J in Grosuplje, Slovenia, and David, T3ØDW in Tarawa, Republic of Kiribati, with whopping signals both ways. I also managed to exchange SSTV pictures with a fellow enthusiast, Charly, F5JGA in Bordeaux, France. So things are not that bad!

Don't forget to write to *Here and There* with your news and views on amateur radio.

Cheers and 73s from Paul, VK3DBP.

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We are seeking an experienced radio technician to work in our Service Department. This position reports to the Service Manager.

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An Amateur Radio Licence would be an advantage, and a broad knowledge of RF techniques and test methods with microprocessor-based circuits and systems from HF to 2 GHz.

Due to the demands of the business, applicants should be able to speak, read and write Japanese.

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Managing Director

Icom Australia Pty. Ltd.

7 Duke Street Windsor 3181 Victoria

ca795/5

11m DXinternational

By Jack Haden

Where has all the 11 metre DX gone?! Things have been rather lean on 11 metres as far as decent DX openings go.

Sure, there's been some trans-Pacific DX about, but not much else to gloat about, I'm afraid.

Those resident in the southern states of Australia have been hardest hit, often going a full week or more before working any thing half-decent on the band.

However, the gang in north Queensland, the Northern Territory and north-west coast of Western Australia, although reporting lean times too, are often experiencing better DX openings and paths than their southern cousins. Just the other day I heard a station in WA talking to a South African, but all I heard was the WA station — not a trace of the South African was heard here in Sydney.

Soapbox... contest confusion

Many Australian DXers have complained to me about the lack of starting and finishing time conformity when it comes to radio contest activities on 11 metres. Apparently the use of local times in preference to the GMT/UTC time, normally used by all DXers, is ignored by some DX groups in Australia. Using local times has caused much confusion and belly-aching, due to local time differences between some states, especially in the daylight saving period.

Amateur radio contests, be they local or global, appear to have no difficulties whatsoever in starting and finishing as per the GMT clock. Alas, we on 11 metres still seem to be lacking in quite a few avenues of professional operating ethics with general adherence to the UTC time as something behind our comprehension and thus best left to those on the amateur bands.

The global time system, UTC, was formulated for the very reason of establishing a standard world time for communications to avoid conflicts of local date and time, thus ending any scope for potential confusion. So, next time the contest time rolls around, how about we all kick off together by using a UTC date and time instead of the conflicting and utterly confusing midday in each state nonsense? To those who wrote in bringing this contest fiasco to my attention, thank you, and I hope your club bosses upon reading this, may see light and common sense at the end of the proverbial tunnel!

DXpedition news, special events and other rumors...

The June/July calendar has some interesting operations from various far-flung places scheduled for the DX world. Whether or not they come to fruition, of course, is anyone's guess. There are some even scheduled for our own part of the world so not all is lost for some of us yet! Then again, should you become a wee bit bored, there's always 10-

SD-0 or 91-SD-0 drifting about to keep you in practise.

San Marino hopefully will come on air via 13-AT-423/36 starting this July and concluding in August. The QSL route given is via 13-AT-423, Werner, PO Box 102028, Köln 50460, Germany.

Quite a few of us still need San Marino so here's a chance to work it — conditions permitting of course...

Oman is supposed to be active on and off all year round with station 180-CA-DX, but I have not yet heard it on air. Also from the same mob comes **Cuba** which was to sign 88-CA-DX all year round too. If you are lucky enough to work either one then cards go via: Mr Giancarlo, PO Box 19, Casalete 10040, Italy. Keep in mind either operation may have yet to appear, so keep an ear open.

Anguilla in the Caribbean was supposed to have been activated by Jorge the 5-AT-109 signing portable 219 prefix during June through to July. QSL via PO Box 10262, Maracaibo 4002, Venezuela.

Andorra may be all over by the time you read this as 51-DT/P was an operation planned for the two days June 3 to 5. However, if you were one of the winners and worked it, then cards go via PO Box 15, Chef Bouteinne 79110 France.

Morocco, Hungary and Slovakia are scheduled on air in a DXpedition capacity during the European summer (which, of course, is our winter). Conditions permitting, keep an ear on guard for: 76-BRC/0, 109-BRC/0 and 330-BRC/0 respectively around the various DX frequencies. QSL route for the three operations is: BRC QSL Bureaux, PO Box 33, Zichem 3271, Belgium.

Monaco is one of those semi-rare DXCC countries out of the continent and is rumored due to appear on air during our winter via 107-EL/0, but actual dates are not known. QSL route is via The Eagle Lads HQ, PO Box 1240, Helden 46356, Germany.

Pakistan is reported to be active, on a short-term basis though, by way of Jan signing as the 114-PAW. Jan is from Holland and hopes to be in Pakistan for another three months or so as you read this. Be cautious when QSLing Jan, as mail has sometimes not been getting to him. He suggests *not* to send any cash for return postage at the moment.

Luxembourg, Malta, Isle of Man and Kazakhstan should be about as you read this until the end of July signing as 54 BRC/STS, 93 BRC/STS, 137 BRC/STS and 308 BRC/STS respectively. The 'STS', I'm lead to believe, stands for 'Save The Seals' and they are soliciting donations for the event. QSL via the BRC bureaux mentioned in the next item. I wonder if the donations are tax deductible?!

Marconi celebrations on 11 metres are about to end at the end of June as 1-BRC/Marconi closes down. If you were lucky enough to work this one then cards go via:

BRC Bureaux, PO Box 33, Zichem, 3271 Belgium.

A **VE** (Victory in Europe) special event station marking the 50 years since the allied liberation of Europe during World War II is on the air as 19-AT/LO (Liberation Overseas) and closes down June 30, so you have only a couple of days to catch them. QSL via 19-AT-266, Steven, PO Box 297, Kampden 8260-AG, The Netherlands.

Latin America and the Caribbean

The decline in propagation has taken its toll on this region, too. Although some brief openings have occurred during the daylight hours, the signals have been very poor and subject to rapid fade and path changes. Still, as they say, some is better than none!

Belize was also a hard one to work on 11 metres not so long back, but these days the 218-AT-104 operated by Daniel appears to be quite active on the band. Around the 0415z mark Daniel was a weak, but workable, four by one. His QSL Manager is Jaime, the 49-AT-012. Also doing the rounds was the 218-SA-101 operated by Herman, who at 0055z was a readable five by one. Herman has a QSL Manager, the 49-SA-012, in the Balearic Islands.

The **US Virgin Islands** are reported as active by way of Mark, signing as the 127-BA-157. At 0335z Mark was a strong five by eight report whilst working a few Sydney stations. The 127-AT-104 has also been reported as active too.

The **South Shetland Islands** is reported on air via the 161-AT-230, signing as 200-TDC-0 for the duration of the operation. Quite a few in the Pacific have made it through, but neither the planned length of the operation nor the QSL route have been publicised yet.

Trinidad & Tobago has been doing the rounds on 11 metres by way of the 158-JT-359 who was five by seven at 0110z. Later, at 0245z, the 158-CZ-104 was a good steady five by five.

St Lucia was logged at 0159z by way of 143-AT-102 operated by Linus, who was a good five by five at the time. QSL for Linus goes via PO Box 255, Soufriere, St Lucia, West Indies. Also noted around the same time was 143-JV-153 at a better five by eight report.

Aruba in the Dutch West Indies was represented on the band with the appearance of 232-AT-106 operated by Joy, who was five by nine at 0345z. A few years back there were many stations active from Aruba on 11 metres, but most are seldom heard these days. What's happened to the Flying Eagle group out of Aruba?

Jamaica in the West Indies was logged by way of Jaime, who signs as 23-AT-103. At 0300z Jaime was a reasonable five by four at the time and worked a number of station in the Pacific region.

Costa Rica once had an abundance of stations active on 11 metres, however few are heard these days, so I was surprised to log a five by eight signal from Eduardo the 69-EN-850 the other week. Eduardo had a number of stations in eastern Australia chasing him for a contact. Activity from 69-AT-102 and the 69-WH-01, who doesn't QSL, have also been noted.

Anguilla is scheduled to be active by way of Jorge, the 5-AT-109 signing portable 219 prefix during the months of June and July. Conditions permitting, this will be an excellent chance for those of us in Oceania to secure this one if you still need it. QSL via Jorge's home address: PO Box 10262, Maracaibo 4002, Venezuela. Return postage appreciated.

Saint Vincent came on the band via the 220-AT-104 who, at 2359z was a fair five by five report into the Pacific with Julian at the helm. After working a few North Americans, some Australian and New Zealand stations made it through for a contact. QSL via PO Box 1331, St Vincent, West Indies.

Arabia and the Gulf States

Reports from this region have been very scant indeed, especially for us here on the east coast of Australia. I have heard, however, that those on the west coast are still getting reasonable contacts into the region from time to time. This is usual for this time of the year; the path rarely extends right across to the eastern seaboard in the winter months, and if it does, signals are usually very weak and subject to flutter or fade with the opening often lasting a few minutes at best.

Bahrain was rumored to be about 11 metres with mention being made that the 150-SG-03 was heard in recent weeks, although other details remain unclear. Quite a few DXers have found Bahrain a difficult one to QSL with, so let's hope the 150-SG-03 proves to be a winner.

Qatar came through the noise at a miserable three by three report the other week here in Sydney by way of the 115-AT-002 or 102. Quite a few east coast stations called but none appeared to make it through for an exchange of signal reports.

The **United Arab Emirates** is usually about by way of 94-AT-101, and at 0710z he was a good five by four peaking six here at the time. A number of Australian DXers complain that this particular station often turns a 'deaf ear' so to speak when called by Australians. Perhaps he has enough Australian QSLs already in his collection!

Africa and Indian Ocean profile

Depressed conditions have meant few openings to this area, although those on the west coast have been making the odd contact to east coast Africa and the islands in the Indian Ocean. Unfortunately for those on the east coast, and more so those in the southern states, the pickings remain very lean at that. However, if worse comes to worst they tell me houses are still cheap in Western Australia!

Gabon is said to have been active from time to time by way of 215-TR-001, name

unknown from the capital of Libreville. Quite a few in this region still need Gabon so it's welcome news to learn of this activity. QSL via PO Box 85, Libreville 8000, Gabon.

Zaire was noted on the band at 0745z by way of 162-ZR-01 operated by Ken. With a poor three by one report Ken had trouble making himself heard in the Pacific. Also heard from Zaire was the 162-AT-104, again with a very weak signal on Australia's east coast. Cards for this one go via the 14-AT-874 in France.

Mayotte Island in the Indian Ocean was active the other week with a female operator calling 'CQ from 189 division' around the 0700z mark. She was a fair four by two at the time. A day or two after I logged another from Mayotte by way of 189-CDP-001 with Chris at the mic, but again, signals were very poor. QSLs for Chris go via PO Box 222, Dzaoudi 97610, Mayotte Island, Indian Ocean.

The **Central African Republic** came through very weak at 0643z the other day, simply signing as 176 Division. I heard the station call many times on the call frequency before being picked up by a Hawaiian station. The African's signal was a barely readable three by one report at best.

Algeria was reported active on 11 metres by way of 146-DX-101, which has been operated by Marco in recent months, although details of the station remain unclear to date. This activity is more than welcome as Algeria has never been an easy one to work. Confirming it is another story, too...

The **Ivory Coast** is another hard one to crack on 11 metres, however there has been some recent activity to keep DXers in the Pacific region on the alert. The 84-WRG-001 was active a couple of months back just above the 40-channel block, and in the same period a French station, 14-AT-301, was reported to be signing from 84 prefix, too, and he was worked by many in Europe.

The European Report

Sporadic conditions have meant a variety of paths into the continent accompanied by fluctuating signals and, as usual, the regulars from western Europe have dominated the openings over some of the more populous areas, radio-wise, from eastern Europe. However, little of substance has been noted since the last decent opening back in April as far as the southern states are concerned...

Greece was attracting quite a lot of activity the other week from DXers in Asia around the 0945z mark with a station signing as 18-SG slash something I couldn't quite hear.

My guess is that it was the 18-SG/SI operation from Salamis Island, good only for IOTA points.

At the time the station was a barely readable three by one in Sydney. If it was, then QSL cards go via: Mr Akis, PO Box 49, Salamis Island 18900, Greece. Return postage essential.

Malta is often about when Europe comes in, providing you can get them away from the usual hurly burly of European stations. Charlie the 93-AT-108 is usually active at 0700z and was five by five, while further up the band 93-MR-101 operated by Lou was a

fair five by two. Just the other week, Dominic, the 93-AT-102 was also heard about.

Isle of Man is one most of us should have by now, and that will have been helped along by an eight-day event from June 3 with a special event station signing as 137-AT/TT. The 'special event' was the famous TT — the motorcycle races which put the Isle of Man on the map. QSL route is via the 26-AT-137, Bob in England.

Czech Republic is also becoming quite common on 11 metres, but some nights they are there and other nights nothing! Recently I logged 329-AT-102, 329-AT-109, 329-CZ-02, 329-CZ-04 and 329-DD-101 amongst others heard between 0800z and 1145z when conditions are available.

Oceania and South-East Asia

As usual, this is the most reliable DX path during our winter, especially during daylight hours when the band is unpredictable and good open in any direction. A good indicator that the band is open is the observance of fishing net beacons transmitting a three-letter callsign in Morse as they float about the Pacific. Running only a couple of watts of power, they are excellent propagation monitors.

The **American Independence Day** is a phenomenal celebration spreading across the USA and its overseas territories. This year there will be a special event station on 11 metres by courtesy of 2-AT/IND. It's not clear whether the station will be active only on July the fourth, or throughout the whole month. QSL via PO Box 916, Jena 71342, USA.

Rotuma (325) is a rare one for most of us and a much welcomed appearance made by Peter, signing as the Whiskey-6, created quite a bit of interest. Peter was noted at 0530z on 33LSB with Ben the 43-AT-193, and reports he has no extra channels, so if you need him you had better listen on channel 16. QSL via PO Box 45, Rotuma Island, via Fiji. Return postage a must if you wish a reply.

Fiji has been reported active by way of the 427 operated by Tony, and at 0557z he was a steady five by five from the island of Viti Levu (the main, and most populous island of Fiji). QSL route unknown.

Kirghizia was heard at 0700z by way of Vladimir operating as 309-KKZ-02, and was a good five by nine at the time. Further up the band Yuri, the 309-TR-101, was also strong, being five by eight at the time and announced that he has a QSL Manager in Germany.

Asiatic Russia is quite common on 11 metres, with a variety of callsigns about. Recently heard were the 302-CG-103, 302-ON-107, 302-AR-11, 302-AT-109 and 302-RR-02, and signals have been quite strong, up to five by nine in some cases in the period 0500 to 1000z.

Well, that's it for now. Let's keep our fingers crossed that things might pick up a little on 11 metres. As usual, any news & views can be sent direct to me via PO Box 299, Ryde, NSW, 2112. A SASE is compulsory for a personal reply...

73 de Jack.

Jack Haden checks out the DX on 27MHz...

Propagation forecasts

East - England (short path) 28.5 24.9 21.2 18.1% 14.2 ..AAAAAA%.....% 10.1 A%FF 7.2 FFF 3.6 FFF 1.8 FFF 0.9 FFF MHZ UT 00 06 12 18 24	East - England (long path) 28.5 24.9 21.2 18.1 ..% 14.2 %%%...% 10.1 AFFA 7.2 A 3.6 1.8 0.9 MHZ UT 00 06 12 18 24	ABOUT THESE CHARTS The data on these pages are graphs showing forecasts for expected HF operating conditions between Australia and a number of important DX destinations. The information they contain is prepared by IPS Radio and Space Services, a division of the federal Department of Administration Services. IPS monitors changing radio conditions — which are affected most greatly by fairly predictable changes in solar activity — and issues reports and warnings based on that data. Stations in the eastern half of Australia should refer to graphs on the left hand page. The data on the right hand page is calculated for stations in the western half of the continent. Of course, if your location is in the middle of the continent try reading them <i>both</i>... then make an educated guess. The horizontal axis of each graph represents the hour of the day expressed in Universal Co-ordinated Time or UTC ('z'). The vertical axis lists specific point frequencies within reach of each HF amateur band. The maps are easy to read. First go to the map which looks closest to the area in which you are interested. Look <i>up</i> from the time and <i>across</i> from the selected band to the point at which the two variables merge. Note which symbol — if any — appears at the intersection of the particular time and frequency combination for that area and refer to the legend (right) to find the sort of propagation most likely to apply. If the space is blank the forecast is not good — your time and frequency combination is unlikely to allow communication to the destination station.
East - Central and East Coast USA 28.5 24.9 21.2 18.1 %%% 14.2 FFFFF%.....%AAAAAAAF 10.1 AFFFFF%FF 7.2 FFFFFF 3.6 FFFFFF 1.8 FFFFFF 0.9 FFFFFF MHZ UT 00 06 12 18 24	East - West Coast USA 28.5 24.9 21.2 %%% 18.1 SSSSS% 14.2 ASSSSSS%.....%AAAAAA 10.1 SSSSSSSSS 7.2 SSSSSSS 3.6 SSSSSSS 1.8 SSSSSSS 0.9 SSSSSSS MHZ UT 00 06 12 18 24	
East - South America 28.5 24.9 21.2 .. 18.1 ..% 14.2 %%%.....%FF% 10.1 AFFFFF%AA 7.2 FFFFFFA 3.6 FFFFFF 1.8 FFFFFF 0.9 FFFFFF MHZ UT 00 06 12 18 24	East - West Indies 28.5 24.9 ... 21.2 %%% 18.1 FF%% 14.2 FFF%%AAA AFFFF 10.1 FFFFFF%F 7.2 FFFFFF 3.6 FFFFFF 1.8 FFFFFF 0.9 FFFFFF MHZ UT 00 06 12 18 24	East - Japan 28.5 24.9 21.2 18.1 .% 14.2 SSSSSSS%.....SSSS 10.1 SSSSSSSSSSS 7.2 SSSSSSSSSSS 3.6 SSSSSSSSSSS 1.8 SSSSSSSSSSS 0.9 SSSSSSSSSSS MHZ UT 00 06 12 18 24
East - Central Europe 28.5 24.9 21.2 .. 18.1% 14.2 ..AAAAAA%.....% 10.1 AF%%FF 7.2 FFFF 3.6 FFFF 1.8 FFFF 0.9 FFFF MHZ UT 00 06 12 18 24	East - Middle East 28.5 24.9 21.2 .% 18.1 .%FF% 14.2 %FFAAAAAA%.....% 10.1 FFFFFF%FF 7.2 FFFFFF 3.6 FFFFFF 1.8 FFFFFF 0.9 FFFFFF MHZ UT 00 06 12 18 24	East - North Africa 28.5 24.9 21.2 18.1 .% 14.2 %%.....% 10.1 FFF%FA 7.2 FFFFF 3.6 FFFF 1.8 FFFF 0.9 FFFF MHZ UT 00 06 12 18 24
East - West Africa (short path) 28.5 24.9 21.2 18.1 .. 14.2 FF 10.1 A %F F%A 7.2 FFFFF 3.6 FFFF 1.8 FFFF 0.9 FFFF MHZ UT 00 06 12 18 24	East - West Africa (long path) 28.5 24.9 21.2 18.1 ..% 14.2 AAA...%.....FAAAA 10.1 %F 7.2 3.6 1.8 0.9 MHZ UT 00 06 12 18 24	East - South Africa 28.5 24.9 21.2 .. 18.1 .% 14.2 SSSS% 10.1 .A AA A%.....% 7.2 SSSSSMMM 3.6 SSSSSMMM 1.8 SSSSSMMM 0.9 SSSSSMMM MHZ UT 00 06 12 18 24

ter July 1995



LEGEND TO SYMBOLS

- . Propagation is possible, but unlikely at this time and frequency on more than half the days of the month.
- % This frequency/time pair should allow communications on between 50% and 90% of the days of the month.
- F Your best bet: first "F" mode conditions should apply on at least 90% of days this month for the given time and frequency.
- E Propagation via the "E layer" expected on up to 90% of days of month at this time and frequency.
- P A fair mixture: up to 90% chance of a path using "F mode" and between 50% and 90% probability of an "E layer" path.
- B A good mixture: up to 90% chance of a path using either "E layer" or mixed "F" modes.
- M A good mixture of combined "F" modes - both first and second mode up to 90% of the time.
- S Second "F" mode conditions should apply on at least 90% of days this month for the given time and frequency.
- A High atmospheric absorption of the signal is likely - better to use a higher band. Too close to the ALF for good HF signals.

West - England (short path)

28.5
24.9
21.2
18.1
14.2 % . . . % A A A A A A A A %
10.1 F A % % % % % F
7.2 A F F F F F
3.6 F F F F F
1.8 F F F F F
0.9 F F F F F
MHZ
UT 00 06 12 18 24

West - England (long Path)

28.5
24.9
21.2
18.1
14.2 % % % . . . % % . . . % %
10.1 A
7.2
3.6
1.8
0.9
MHZ
UT 00 06 12 18 24

West - Central and East Coast USA

28.5
24.9
21.2
18.1 % % % . . . %
14.2 A A A A % A A A A A A A A
10.1 % % % F A
7.2 F F F
3.6 F F
1.8 F F
0.9 F F
MHZ
UT 00 06 12 18 24

Perth - West Coast USA

28.5
24.9
21.2 . . . % % . . .
18.1 % % % % % % . . . F %
14.2 A A A F F F F F % % A A A A A A
10.1 F F F F F F F F
7.2 F F F F F F
3.6 F F F F F F
1.8 F F F F F F
0.9 F F F F F F
MHZ
UT 00 06 12 18 24

West - South America

28.5
24.9
21.2
18.1
14.2 % % %
10.1 F F A % % . . . F
7.2 F F F F F F
3.6 F F F F F F
1.8 F F F F F F
0.9 F F F F F F
MHZ
UT 00 06 12 18 24

West - West Indies

28.5
24.9
21.2 . . . % . . .
18.1 % % % % % . . . %
14.2 F F F F % % % % . . . % F
10.1 A F F F F % A
7.2 F F F F
3.6 F F F
1.8 F F F
0.9 F F F
MHZ
UT 00 06 12 18 24

West - Japan

28.5
24.9
21.2
18.1 . S S % % % % % . . . %
14.2 S S S S S S S S % S S
10.1 A S S S % % % % % . . A
7.2 S S S S S S S S S S
3.6 S S S S S S S S S S
1.8 S S S S S S S S S S
0.9 S S S S S S S S S S
MHZ
UT 00 06 12 18 24

West - Central Europe

28.5
24.9
21.2
18.1
14.2 . . . % A A A A A A
10.1 F A F % % % % F
7.2 F F F F F F
3.6 F F F F F F
1.8 F F F F F F
0.9 F F F F F F
MHZ
UT 00 06 12 18 24

West - Middle East

28.5
24.9
21.2
18.1 . % % % % % . . .
14.2 . % M M M M M M M M M M
10.1 M S A S M M M M M M M M M M
7.2 A M M M M M M M M M M
3.6 M M M M M M M M M M
1.8 M M M M M M M M M M
0.9 M M M M M M M M M M
MHZ
UT 00 06 12 18 24

West - North Africa

28.5
24.9
21.2
18.1 . . . % % % F F . . .
14.2 % . . % F A A A A A A A %
10.1 F A F % % % % F
7.2 F F F F F F
3.6 F F F F F F
1.8 F F F F F F
0.9 F F F F F F
MHZ
UT 00 06 12 18 24

West - West Africa (short path)

28.5
24.9
21.2
18.1 . . . % F F F . . .
14.2 . . . % . . . F F F F A A . . .
10.1 F F A % % % % F
7.2 F F F F F F
3.6 F F F F F F
1.8 F F F F F F
0.9 F F F F F F
MHZ
UT 00 06 12 18 24

West - West Africa (long path)

28.5
24.9
21.2
18.1 . . . % . . .
14.2 A A % F F % . A A A A A A A A A A A A
10.1 A
7.2
3.6
1.8
0.9
MHZ
UT 00 06 12 18 24

West - South Africa (short path)

28.5
24.9
21.2
18.1 . . . % M M M M %
14.2 . . . M M M M M M . . .
10.1 . . . S S S S S S % % % % . . . % . . .
7.2 M A M M M M M M M M M M
3.6 M M M M M M M M M M
1.8 M M M M M M M M M M
0.9 M M M M M M M M M M
MHZ
UT 00 06 12 18 24

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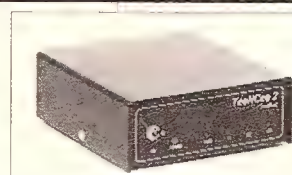
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- See Amateur Radio Action April 1994.

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DX UPDATE
WHAT'S HAPPENING
OUT THERE?

3V Tunisia

3V8BB is currently active again. This time, activity is on CW, SSB, RTTY and the satellites. 3V8BB has been heard on 14,240 kHz SSB around 2230z, 14,030 kHz CW around 2315z and operator Mike, JA2PDQ, was heard on RTTY around 14,083 kHz between 0030 and 0130z. Activity is to last until late June. QSL via JF2EZA.

3W Vietnam

Warren, **KF7AY**, reports that members of the Page DX Association and the Central Arizona DX Association will be travelling to Vietnam in January, 1996.

Tentative dates of operation will be January 23 through February 2. Plans are for an emphasis on the low bands from the coastal city Nha Trang, with concentrated top-band activity during the 160 metre contest. Main mode of operation will be CW, but there will also be RTTY and SSB activity on 40-10 meters, plus the WARC bands.

Permission and logistics permitting, there may be a limited first-time IOTA effort from the island of Hon Tre, which is part of the Mein Trung group in the South China Sea. No call sign has been issued as of yet.

As with previous operations, the Vietnamese government will likely assign fixed frequencies and these will be published well in advance. Participants will be N7WTU, WA7MTF, K5VT, AA7WP, AA7NO, WA7LNW and KF7AY. More details in the months to come.

5H Tanzania-net and TARC

Michael, **5H3MS**, advises that a new amateur radio club has been formed in 5H3-land and a Tanzania-Net is now on the air, active.

On May 6, 1995, the **Tanzania Amateur Radio Club (TARC)** had its inaugural meeting and the club decided to meet every Sunday morning at 0500z on 7080 kHz.

Everyone is welcome to join in on the Tanzania-Net. The TARC is in the process of getting registered as a club in Tanzania, and once this is done it will become a member of the IARU.

If you need information about amateur radio in Tanzania (eg getting a license), you can write to: Tanzania Amateur Radio

Club, c/o Tanzania Scouts Headquarters, PO Box 945, Dar Es Salaam, Tanzania. You can also send a message to Michael: 5H3MS@zs5s.zaf.af or via e-mail to: mseitz@hnettan.gn.apc.org

9Q2L QSL notice

Alex, **9Q2L (PA3DZN)** has announced that QSLs for the 9Q2L operation goes via PA3DMH and not PA3DLM. Alex mentioned PA3DLM is the QSL Manager for his operation as 9X5EE. The operator is the same, but the managers are different.

BV9P Pratas Island (update)

Martti, **OH2BH/VR2BH**, has supplied the following news release as of 0000z, Sunday, June 4, from Wayne Mills, N7NG: Poor propagation affected the BV9P operation during early June. A total of 21,000 QSOs had been made as of early June. Also the island power outlet has been regularly off and is not providing enough reliable power — the group often uses batteries.

CY9 St Paul Island

An operation to this island is all set to go starting July 27 through August 2. Look for the following operators: Dan/WA4DAN, Ron/AA4VK, Bob/KW2P, Bill/K4TVE and Vance/W5IJU. Operators will sign home-call/CY9.

Vance/W5IJU will attempt a trans-Atlantic 144 MHz contact during this time. If anyone in Europe, Africa or Oceania would like to make this attempted QSO with him, please send him a time schedule including time UTC and date. He plans to use 28,870 kHz for contact frequency just prior to the scheduled time.

By the way, this will be the first joint operation by the DXpedition team since its highly-successful KP1 and KP5 DXpeditions. The major sponsors of this CY9 operation include: Cushcraft Corporation, Dunestar System and The Radio Works Company.

The team is still in need of donations to help offset the high cost of shipping for its DXpedition equipment. QSLs and donations for the CY9 operation should be sent via WA4DAN, Murry Adams, 403 East 14th Street, Greenville, NC 27858, USA.

IOTA NA-065 — Guemes Island, USA

The following statement is from Debby, **AA7RW**: "I am going on a DXpedition to Guemes Island, NA-065 for the IOTA Contest, July 29-30, 1995. I'll be on 10 through 80 metres SSB only. I will also operate some Friday afternoon (July 28) to familiarise myself with my host's (NM7M/NM7N) station. QSL to my call-book address (94 and on) or via the bureau. Please be patient — this is my first DXpedition."

IOTA NA-031

The **South Coast Wireless Society** from Pawcatuck, Connecticut, USA plans

Compiled by Len Shaw, VK3ALS
PO Box 622, Mount Eliza 3930

to activate Block Island, RI (NA-31) during the IOTA contest July 29 and 30. They will be active on 10, 15, and 20 metres, and possibly on 40 and 80. Callsign is to be announced. This operation will be the first from NA-31.

N6VI/KH7 not on Kure Island

Marty reports he was active in the CQWW WPX CW Contest as N6VI/KH7, but was not operating from Kure Island.

He was operating from his home in Hawaii and was merely using one of the new prefixes available for Hawaii amateurs in connection with the vanity callsign program.

He tried to send "QTH Hawaii" regularly so as not to mislead anyone; the intent was merely to give the deserving contesters another prefix multiplier they would not otherwise have.

Principality of Seborga

It has been rumored that the ITU has allocated the **T8A-T8Z** call-block to the Principality of Seborga.

Jean, F6AJA, reports talking to Ted, F8RU, who is retired from ITU in Geneva and has phoned the current ITU manager. Ted reports that at this moment no allocation (T8A-T8Z) has been given to Seborga and this information is absolutely wrong.

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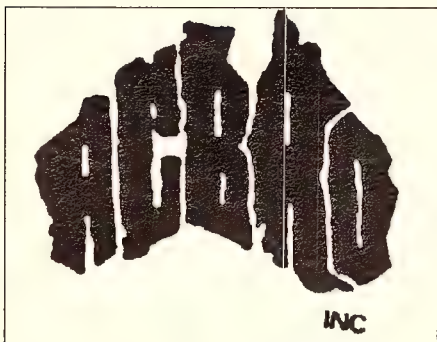
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AUSTRALIAN ASSOCIATION OF CITIZEN and BAND RADIO OPERATORS Inc.

Call channel use & abuse

ACBRO committee meetings have been discussing the implementation of a regulated HF call channel on Channel 35. Mention is often made of the abuse of the agreed call channels, both on HF and UHF, by the many operators who either ignorantly or wantonly chatter on aimlessly to the annoyance of others.

If those operators were asked at the original conception of the CBRS system how a system could be derived where an initial contact can be made with another operator, they would have probably agreed that the only successful way to operate would be to set aside a special channel for making first contact and then moving off to another channel to carry on the conversation. Thus, they would have shown as much wisdom as that possessed by those in high places who engineered the system of having a special channel for initiating a call.

In fact most would agree that this is the only logical way for any two-way radio system as provided by the CBRS as it is known today, to operate successfully. And yet with all of this logic with which all may agree, how come the call channels in the CBRS, at much of the time, resemble a state of mayhem? Why do so many operators insist that it is okay to carry out lengthy chats or tests on this particular channel which is otherwise dedicated? Do they have any thought for other operators who may be on the side awaiting a weak signal from a mobile or boat whose operator may be maintaining a sked?

The answers to such questions may not be that simple; such an operator may be either ignorant of the regulations — after all not much info came in the box when the set was bought — or he/she is one who can be just labelled as selfish.

ACBRO, with its members, is keen to demonstrate the best use of the CBRS, and is conscious that new operators may be entering the class license field with little or no knowledge of the regulations that cover call channels and the like.

So we mention it in places such as this, as it's a prudent way to establish better use of the service that could otherwise be enjoyable for all.

The name given to the call channel as such may be a misnomer. Users of the CBRS facility may have been better served if a particular channel was known as a listening channel. After all, with efficient use, it would be used for listening more than anything else!

Users are reminded that if others cannot rely on being able to hear a call on this specific channel, which is often the case because of idle chatter, then the purpose originally intended for this slot in the band is pointless. So if more of the operators can accept this approach, the service will become better regulated.

For those who have need to use the channel for initiating a call, they should appreciate then, that the station being called has a very good chance of responding (if they are listening) if all concerned were to accept that the channel is a listening channel.

And on these terms also, it could be assumed that the station being called after no more than two calls, just did not 'have his ears on' if he did not respond. The nuisance to listeners having to hear repeated calls, as is often the case, could be reduced to a tolerable level.

The CBRS does not have a particular channel set aside for testing equipment, as some may have thought would have been a good idea. This of course does not provide any excuse for using the call channel for prolonged discussions in conducting tests.

As the regulations clearly define the use for the call channel, they would not prohibit such a call as "This is station XYZ seeking a test copy on channel so and so" (as long as you had established that the channel was free).

Once a test has been established on a 'chat' channel, more time can be spent in clarifying more points than one may have originally intended. In the main, of course, the call channel traffic is reduced to enhance its listening tolerance.

In this era of the Class License system where operators need not approach the authorities to seek a license and any operating recommendations, newcomers to the service are in many cases, 'flying blind'. And they

should quickly learn which is the call channel (and other regulated channels) and use them with the respect that they deserve.

They should be taught to initiate a call to their colleagues by using call-signs. That is, call the callsign of the station being called, followed by your own callsign. So we'd have... ABC456, this is ACBRO 789 or whatever.

The use of names is unnecessary unless a specific person at a multi-manned station is sought. The thought should be foremost in the minds of operators, that any reduction in transmission time on the call channel will enhance it as a listening channel, and that can't be all that bad.

The committee of ACBRO, in offering such tips as suggested here, is keen to encourage better use of the call channels on HF and UHF in a period when they are seeking changes to regulations for the betterment of the service.

It would certainly enhance our case for change if the authorities when monitoring the service could see a greater degree of respectability on the call channels in place of the mayhem generally observed.

If this is a plea from ACBRO for improvement, let's make it now, before the onset of the next lot of skip. Let's make the call channel a *listening* channel.

The call channel should be likened to a busy intersection on the roadways. The less time spent on it is to your advantage, and that of others.

For those new to the band (or those who cannot remember) the designated call channels in the CBRS are as follows: HF band AM **Channel 11** (27.085 MHz); HF sideband **Channel 16** (27.155 MHz) UHF Band **Channel 11** (476.675 MHz)

List of clubs

The list of ACBRO'S affiliated clubs is missing from this edition. It will appear on alternative months. The next listing will welcome its latest applicant: **Mike Kilo Social Radio Club** of PO Box 193, Boolaroo, NSW 2284. ACBRO are pleased to welcome the club as an affiliate.

Here's your chance to win this superb Uniden UBC9000XLT communications receiver, compliments of Radio & Communications magazine!

It couldn't be easier. All you have to do is answer a few simple questions and one of the fabulous new scanning receivers could be yours!

What we want to know is what makes this receiver different to most other desktop scanning receivers. (Hint: it's round and it's on the front panel. In both ARA and CBA reviews, our tester said he could change channels faster on this radio than on any other scanner he'd ever used.)

Make sure your entries arrive before the cut-off date, and remember we cannot accept photocopied entry forms or entries by fax.

Post your entry to R&C Uniden Competition, PO Box 119, Oakleigh, Victoria 3166 to arrive before last mail July 5. The lucky winner will be notified.

No antenna? You're in luck. The prize-winner also gets an Oztenna Longreach antenna to pull in the signals!

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Readers of RADIO and COMMUNICATIONS may use the CLASSIFIEDS column to the extent of 25 words absolutely free! This offer applies only to private "For Sale" or "Wanted" classified listings, and to computers, software or computer peripherals and other hobby communications equipment - scanners, CBs, etc.

A limit of one classified advertisement applies to each advertiser. Any additional words must be paid for or the advertisement will not be accepted. A nominal fee of \$4 per additional 25 words or part thereof will apply. This fee should accompany your material if applicable. Please enclose this fee or your advertisement will not appear. Preference is given to paid advertisements, and we receive an awful lot of them each month.

Your advertisement's inclusion cannot be guaranteed, but every effort will be made to place your advertisement in the issue following receipt of copy. The 25 words must include your name and phone number.

The publisher reserves the right to amend or reject any advertising material considered unsuitable for publication.

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Repeat CLASSIFIEDS advertisements will be accepted for a fee of \$4 for every 25 words - including the first 25.

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ed for publication in these classifieds pages. This classified section is for private sales/purchases only.

For details of display advertising elsewhere in the magazine phone Kate Shaw on (03) 752 6186

Readers should note that all advertisements are required to comply with the provisions of the Victorian Consumer Affairs Act of 1972. They should be aware that, under the above Act, Post Office box numbers can be published only if the full name and residential address of the box holder is supplied with the advertising material.

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Clip this form and post it complete to:
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All classified advertising copy is typed in by a non-amateur typist who, reasonably enough, cannot decode illegible writing. In short, she types what she sees, and if your writing is poor you can expect either crucial errors, or the non-appearance of the advert. PLEASE ENSURE THAT YOUR CLASSIFIED IS LEGIBLE AS ALTHOUGH YOU KNOW WHAT YOU'RE ADVERTISING A TYPIST DOESN'T!

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• **Shack clearout.** Yaesu FT-101E \$350. 2M HT \$150. 1GHz freq counter \$150, 500W dummy load \$30. Rotator \$50. Coax switches, parts for linears variable caps, inductors heatsinks, fans, 811s, 6146s, resistors, capacitors, fuses, 1800V 1/2A supply, transformers, HF antenna, Morse key. Alex, VK1AIR (06) 254 6216. Transmitting gear sold to licensed amateurs only.

VK2 AREA

• **Antennas** 3ele monoband, 14MHz \$195, 18MHz \$125, hvy dty 4 position coax switch \$55, 23M RG-213 coax \$30, all EC. John, VK2JJ (047) 87 7003

• **ATN** 8-el log periodic, covers 13-30MHz, with all hardware, GC \$420 ono. Phillip, VK2QG (02) 675 3514

• **Comm-64** set for Packet inbuilt TCM-3105 modem, disk drive, power supply, green monitor, manuals, numerous disks \$325 ono, Keith, VK2PRK (044) 48 7278

• **DECEASED ESTATE VK2LC** Kenwood TS-520 xcvr with Shure 444 mic & KP-120 speech proc, \$450 ono. Yaesu FT-101 xcvr \$390 ono. 2-stage triangular windup tower \$400, plenty of coax — make an offer. Tony (02) 653 2274. Transmitting gear sold to licensed amateurs only.

• **Icom** IC-3210A 2M 70cm mobile xcvr 30/25W 22mem VGC. Used as base, with bckt \$650. Greg, VK2CAT (066) 53 4601. Licensed amateurs only.

• **Icom** IC-W21A FM dual-band HT, little use, under warr, spkr/mic, car pwr

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The acceptance of classified advertisements in the Radio and Communications classified advertising section does not warrant in any way that the goods offered are available, free of any encumbrance, in working order or otherwise satisfactory. The purchase of goods by private sale does not offer the purchaser any protection under law, and buyers should be certain the goods under consideration are suitable for the purpose for which they are required. Radio and Communications cannot accept any responsibility for goods advertised in the classified pages and no correspondence will be entered into regarding such goods.

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adptr, with manuals. Marty, VK2KEY (02) 686 6612 or (02) 873 0522. Licensed amateurs only.

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• **Kenwood** TS-520S HF xcvr GC \$470 or will swap for radio with gen cov rxcv. Yaesu FT-23R 2m HT with spkr/mic \$280, Mick, VK2ABL (069) 31 5512. Licensed amateurs only.

• **Kenwood** TS-820 HF xcvr 240V & Kenwood MC-50 desk mic GC \$525, Rick, VK2GAL (02) 525 7040. Licensed amateurs only.

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• **Six metres:** Phillips 828E with full details for conversion & nec parts not xtals \$40, David, CK2BDT (048) 21 5036. Licensed amateurs only.

• **Various:** large quantity of electronic test equipment, linear amps, rcvr exciters, vac caps, high voltage components incl Collins URC-32 txc vr 2-32MHz LKW 240V AC. Phone for list. Berny, VK2ABN (02) 817 5937. Transmitting gear sold to licensed amateurs only.

• **Wanted:** 2M xcvr or transmitter in good or faulty cond. Student cannot afford commercials. Will pay postage. Paul Titze, VK2THN, 2/84 Railway Pde, Granville 2142

• **Wanted:** HF Linear amp working or not Capacitor approx 20MFD 4KVDC. Malcolm, VK2BMS (02) 257 4583 BH, (02) 958 1114 AH

• **Wanted:** Kenwood SW-100A, Keith, VK2PRK (044) 48 7278

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Please make donations of amateur QSL cards to the WIA QSL collection and save something for the future.

Also, if helping a silent key estate, please contact Ken Matchett, VK3TL, 4 Sunrise Hill Road, Montrose 3765, or phone (03) 9728 5350. Arrangements can be made for large quantities of cards. Can you spare a few?

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• **Wanted:** Service manual urgently required for Kenwood TS-530S xcvr will replay costs or copy & return. Maurie, VK2OW (02) 838 1834

• **Wanted:** Swap Uniden HR-2510 10m rig for 2m FM rig. Must be synthesised. Phil, VK2TPH (042) 61 3666. Licensed amateurs only.

• **Wanted:** Yaesu battery pack FNB-3 & FBA-5 required for FT-203 & FT-703 series rigs. Phil, VK2TPH (042) 61 3666

• **Wanted:** Yaesu FT-707 in faulty cond for spare parts, Errol, VK2BET (02) 633 9333 BH, (02) 476 2933 AH

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antennas var, caps, meters. Paul, VK2DMV (066) 52 4389. Transmitting gear sold to licensed amateurs only.

• **Yaesu** FT-107M HF xcvr AC/DC, with FV-107, KW-107, SP-107 \$850. **Yaesu** FT-101B HF xcvr \$400. Tower with ant rotator, cables \$1000. All VGC with manuals. Much more! Will split. Deceased estate. Tom (068) 62 1663. Transmitting gear sold to licensed amateurs only.

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• **Yaesu** FT-ONE HF xcvr with gen cov rx, all service manuals \$950. **Wilson** system 11 4ele tribander \$450. Chris, VK2ISB (015) 069562

VK3 AREA

• **Dentron** linear amp MLA-2500 plus tuner MT-3000A \$1200. **Frontier** electric HF xcvr with ancillaries, not operative \$100. Laurie, VK3DPD (03) 9818 6009. Licensed amateurs only.

• **Diamond** MX-2000 triplexer \$100, Brainer ST-7500 2m/70cm mobile ant \$45, Icom AHB-32 HD trunk lid mount with cable \$30. Damien, VK3CDI (054) 27 3121

• **Drake** TR-7 HF xcvr EC with workshop manual, MC-50 mic, all cables \$700 ono. **Cushcraft** 2x10-el 2m crossed Yagi & polarisation harness \$200 ono. Harold, VK3AFQ (03) 9596 2414. Transmitting gear sold to licensed amateurs only.

• **IBM**-compatible laptop, Amstrad PPC-640 with built-in 2400 baud phone modem \$250. **C-64** with 1541 MK2 disk drive \$100. Mark, VK3TCD (03) 9305 2466

• **Icom** IC-22S 2m xcvr with scan, d/readout all self-contained with pwr supp, mob mount, CCTS/data \$350 ono.

Philips 828 & 1677 xcvr high band easily modified 2m 828 \$85 ono, 1677 \$30, 1677 modified 2m \$60, CCTS/data. Will, VK3WCW (052) 43 5220. Licensed amateurs only.

• **Icom** IC-725 HF xcvr \$1000. Icom IC-575A 6/10M multimode xcvr, DDS, PBT, internal PSU \$1500. Both EC with manuals & accss. Adam, VK3ALM (015) 36 2799. Licensed amateurs only.

• **Icom** IC-735 with SM-10 super mic worth \$250, \$900 lot. **Dentron** MLA-2500 amp 160-10M Eimac 8875 X2 \$1800 ono.

Daiwa coax switch four position \$75, **Yagi** 4ele X10m Werner Wulf GC \$120, **Yagi** Werner Wulf 3ele 15M GC \$150. **Hygain** 204BA needs little work 4eleX20m \$200. Byron, VK3BVM (019) 96 0582. Transmitting gear sold to licensed amateurs only.

• **Icom** IC-761 HF xcvr mint cond \$2800, **Heathkit** amp SB-200 \$500, **Kenwood** TR-8400, UHF FM radio \$300, **Kenwood** 2m all mode TR-9130 \$500, **4-el beam** 15M \$65, **AEA** PK-64 all-mode modem \$80. **Kenwood** TS-940S HF xcvr with extras \$2,550, **Kenwood** TR-8400 70cm mobile \$300. Ron, VK3EF (054) 39 7488. Licensed amateurs only.

• **Icom** IC-765 as new in orig box with manual & mic very low use. \$4200 ono. Wally, VK3DDN (03) 9796 4949. Licensed amateurs only.

• **Kenwood** TS-440S/AT HF xcvr fitted with narrow

SSB & CW filters incl. workshop manual \$1195. Barry, VK3RE (059) 75 4169. Licensed amateurs only.

• **Kenwood** TS-450S/AT xcvr as new complete with box goodies gratis. \$2000. Ring anytime. Jack, VK3EK (03) 9386 2795. Licensed amateurs only.

• **Modem** Maestro Data Optimiser 2400 BPS. MNP error detection correction & data compression manual \$130. Reg, VK3KRN (057) 27 3614

• **Tower** 16M galv windup 2 piece guyed with tiltover base never used c/w rigging. Can deliver \$900. Brett, VK3JHP (03) 9584 1478

• **Tower** 35ft tiltover, 12ft sections incl. stay bearing, rotator mountine, I will dismantle but buyer to collect \$300. Damien, VK3EHP (053) 52 4183

• **Wanted:** Antenna mast ex-Army type triangular 6ft sections, need 4 also 15M of LDF 4-50 Helix & connectors. Terry, VK3KJM (018) 051 763, (03) 9438 5220

• **Wanted:** Desperately seeking Yaesu FTV-250B 2m xverter wkg or not & fair price pls. There must be one out there somewhere! Clint, VK3CSJ (03) 9792 4500

• **Wanted:** Eddystone EC-10MK2 trio 9R59DS comm rx must be GC. Damien, VK3CDI (054) 27 3121

• **Wanted:** Icom IC-475H exchange Icom IC-735 HF. VK3MIT (03) 9338 2328

• **Wanted:** Kenwood SM-220 monitor scope with BS-8 pan adaptor must be complete with leads & manual please. Also VS-1

Please note
that all
phone
numbers are
after hours
unless
otherwise noted.

Please do NOT
quote PO Box
numbers
without supplying
your full
residential address.
This is the LAW.

CLASSIFIEDS...CLASSIFIEDS...CLASSIFIEDS...

voice module. Paul, VK3DA (059) 83 1771

• **Wanted:** Kenwood TS-120S HF xcvr also Yaesu FT-747GX HF xcvr must be in GC. Laurie, VK3KL (058) 29 2334

• **Wanted:** SP-940 ext spkr for TS-940S must be complete with filters & be in VGC. Darrell, VK3ZDE (03) 9725 9342

• **Wanted:** Yaesu for Oscar, can part swap. Paul, VK3AJJ (03) 9572 2178

• **Yaesu** FT-101E HF xcvr 160M to 10m EC YD-248 desk mic, hand mic, 12V-240V leads, manual, \$800. Frank, VK3ZO (03) 9478 5972

• **Yaesu** FT-530HT 2m/70cm HT, 2 batt packs, compat, chrgs \$495. Paul, VK3AJJ (03) 9572 2178. Licensed amateurs only.

• **Yaesu** FT-707 \$600, **Heathkit** 20-A PSU \$175. Orm, VK3ASY (03) 9723 4688. Transmitting gear sold to licensed amateurs only.

VK4AREA

• **AEA** PK-88 \$195, **Standard** C-528 twin-band VHF-UHF with accss \$700, **Yaesu** YC-500J 500MHz counter \$100. Steve, VK4YEK (07) 814 0727. Transmitting gear sold to licensed amateurs only.

• **Antiference** UP-2501A 470-585MHz preamp for UHF TV chnls 21-34 \$50. Glen, VK4UGC (075) 35 0919

• **Icom** IC-551D 6m multi-mode \$550. Alan, VK4BKM (071) 23 4646. Licensed amateurs only.

• **Icom** IC-728 HF xcvr with 500Hz CW-N filter AM/FM unit installed carry handle, mic etc. with Alinco DM-120MVZ 13.8V 25amp power supply. \$2180 the lot. VK4CMS (07) 349 1747. Licensed amateurs only.

• **Kenwood** TH-79A dual-band HT with SMC-34

spkr/mic CTCSS decoder battery case \$750, **Diamond** RH-77 dual-band HT whip \$40. Glen, VK4UGC (075) 35 0919

• **Kenwood** TM-742A dual-band FM xcvr, unmarked \$1000.

Kenwood TM-251A 2m current model \$650. VK4DRY (074) 79 4340. Licensed amateurs only.

• **Kenwood** TS-440S/AT HF xcvr filters fitted PS-50 power supply metered MC-60 desk mic leads & manual al VGC \$1950 the lot. Ted, VK4OW (071) 28 3489. Licensed amateurs only.

• **Swan** 350 HF xcvr with new finals & spare \$250 ono, **HAM-M** rotator \$400 **Kenpro** KR-600RC rotator \$400, valves 2C39A new \$50ea. Niel, VK4JX (018) 65 5004. Transmitting gear sold to licensed amateurs only.

• **Tender:** Estate Kismet 60ft tower, WWII radio cables, radio service manuals, trade manuals, Morse keys, telephone parts from 1890. Peter, VK4APD (07) 397 3751

• **Wanted:** Kenwood TS-670. Niel, VK4JX (018) 65 5004

• **Wanted:** Tube & base 4CXC250B for big 2m linear amp (I wanna nuke next door's chooks). Ed, VK5EDM (086) 32 1102

• **Werner Wulf** duoband 10&15M Yagi beam 2x3 ele plus KR-800S rotator, with control unit & power cable plus hndbks. All items in PC \$500 or would swap for good clean HF xcvr with cash adjustment. Ron, VK4NRG (07) 283 4976

• **Yaesu** FT-757GX MkII all mode HF xcvr only used once \$1250. **AEA** DSP-1232 multimode data controller 9mths warr. \$1200. **AOR** AR-1500 \$400, Noel, VK4VJ (079) 79 2690

VK5 AREA

• **Icom** IC-720A HF xcvr with IC-PS15 P/S desk &

hand mics, manuals, all VG working order, sell as lot \$650. Greg, VK5AKX (08) 262 6855. Licensed amateurs only.

• **Sony** 6800W rcvr \$500, Toshiba laptop PC 40HD 1.44FL \$600, Fred, (086) 45 2762

• **Wanted:** Probus (Professional & Business) amateur operators to form Probus Clubs Net. Would those interested please contact Bruce, VK5XI (08) 255 9606 or Packet via VK5LZ (retired persons club)

• **Yaesu** FT-411 2m HT, as new in orig carton with chrg, FNB-14 PA-6 adptr & soft case \$350 ono. John, VK5KBE (08) 250 7259. Licensed amateurs only.

VK6 AREA

• **Icom** IC-760PRO (same as IC-765) 150W O/P HF xcvr 100kHz-30MHz rcvr, as new cond, built-in PS SM-8 mic voice syn & tone encoder new price \$6000 sell \$3500. Allen, VK7AN (003) 27 1171. Licensed amateurs only.

• **Kenwood** TS-440S/AT HF xcvr with inbuilt ATU mic & mounting bckt. VGC. \$1250 ono. David, (09) 364 6919. Licensed amateurs only.

VK7 AREA

• **Nally** tower, 15m buyer collects, \$600 **TET** HB-443DX Yagi antenna, 4ele incl. 40m \$350, will ship. **Hy-Gain** 18V trapless 80-10 vertical antenna, \$100. **Scalar** SC-22DX 80-10 trapped vertical antenna \$150. **Hills** Telemast, one fully rigged \$100, one plain \$75. Buyer collects. Ian, VK7JY (003) 27 2011

VK8 AREA

• **Yaesu** FT-77 HF xcvr 100W VGC \$500. **Yaesu** FRG-9600 all mode scanner \$550. **Realistic** Pro-50 scanner \$120. **Icom** IC-

720A HF xcvr with gen cov rcvr \$600. Peter, VK8NAJ (089) 52 5324. Transmitting gear sold to licensed amateurs only.

CBs, scanners and communications receivers

• **AOR** AR-1500 scanner \$400, Noel, VK4VJ (079) 79 2690

• **Icom** Comm rcvr \$600, new in box. VK3MIT (03) 9338 2328

• **Icom** IC-R71A rcvr 0.1-30MHz all modes + manual \$1200. **AOR**-1000XLT h/h scanner 500kHz-1300MHz with manual, chrgs \$450. Offers considered. (02) 602 1878

• **Realistic** PRO-2021 programmable scanner 68-512MHz. 200mem chnls \$120. **Modem** Maestro Data Optimiser 2400 BPS. MNP error detection correction & data compression manual \$130. Reg, VK3KRN (057) 27 3614

• **Realistic** PRO-2022 swap for h/h scanner of same specifications. Ring after 4.30pm anyday. Cameron (09) 434 2885

• **Sangean** ATS 803A in GC, with power pack, manual, box \$185 & freight to be paid. David (076) 54 3019

• **Sony** ICF-6800W multi-band rcvr as new. Offers? Jim, (09) 527 9342

• **Sony** ICF-6800W rcvr \$500, Fred, (086) 45 2762

• **Uniden** Washington base 27MHz VGC \$300. Tony (003) 26 3591

• **Yaesu** FRG-7700 comms rcvr \$300. **Commex** Executive scanning UHF radio, \$275,

Electrophone desk mic MC-521A \$60, Will pay postage this end on all items. Adrian, (079) 83 1913 (phone/fax)

• **Yaesu** FRG-9600 all mode scanner \$550. **Realistic** Pro-50 scanner \$120. Peter, VK8NAJ (089) 52 5324

CB UHF REPEATER LIST

NEW SOUTH WALES

Callsign Town/Locality

CHANNEL 1	
BEL01	Belbora
BHI01	Broken Hill
BIN01	Bingara
BOB01	Harden
BRE01	Brewarrina
BRH01	near Broken Hill
BUN1	near Merriwa
CHT01	Charlestown
COR01	Corowa
DNQ01	Deniliquin
GRE01	Grenfell
GUY01	Guyra
JIN01	near Jindabyne
KGL01	Kyogle
MBI01	Moonbi
MRT01	Wilcannia
MTE01	Mt Eagle
NEE01	Dubbo
NIM01	Nimmitabel
NYN01	Nyngan
RYL01	Rylestone
SYD01	Sydney
ULA01	Ulladulla
WAG01	Wagga
WGT01	Walgett
CHANNEL 2	
BER02	near Gloucester
BRH02	Broken Hill
CAN02	Cangai - West of Grafton
EDN02	Bega / Eden
GDH02	Gunnedah
INV02	Inverell
KHN02	Khancoban
KOS02	near Thredbo
KUR02	Sydney - Blacktown
LGW02	Mt Lambie
LIS02	near Byron Bay
MAC02	Port Macquarie
NBR02	Wee Waa / Narrabri
NOW02	Nowra
PAR02	Parke
WAL02	Walcha
WAN02	Wanaaring
WBD02	Walbundrie
VRB02	Urbenville
CHANNEL 3	
CAN03	near Orange
CAS03	Casino
COM03	Mt Kophi
DUN03	Dungog
GIL03	Braidwood
GTH03	Griffith
MDI03	Murrumbidgee
MNA03	Manilla
MOR03	Moree
MTI03	Tubramurra Shire
PLO03	East of Armidale
RWT03	Hay
SYD03	Sydney
TEN03	Tenterfield
CHANNEL 4	
ALB04	Albury
ARM04	Armidale
CBN04	Coonabarabran
DRK04	Girard
GLB04	Goulburn
HAY04	Hay
MON04	Kandos - near Mudgee
MUS04	Muswellbrook
OGU04	Ogunbi - near Tamworth
RIV04	Penrith Area
SOU04	near Cooma
THA04	near Broken Hill
TUL04	Tullibigeal
TWH04	Banora Point
WAN04	Mt Wandera

Callsign Town/Locality

WAR04	Warialda
YNG04	Young

CHANNEL 5 *EMERGENCY REPEATERS*

BIN05	Katoomba
BKE05	Mt Gunderbooka
CAP05	near Tenterfield
CHN05	Charlestown
COR05	Corowa
FOR05	Mount Tallangung
FRA05	Bellingen
GLB05	Goulburn
JIN05	Jindabyne
MTS05	Narromine
MTU05	S-West Slopes, East River
OXY05	Bourke
SYD05	Sydney
TAM05	Tamworth
TBO05	Mt Talbingo

CHANNEL 6	
BAR06	near Narrabri
BON06	Bonshaw - Q/NSW border
COF06	Coffs Harbour
COL06	Oakey
GGG06	Glengary
LGW06	Lithgow
MAL06	Mallanganee
MTG06	Bowral
MUM06	Mumbulla Mountain
NAR06	Narromine
NEW06	Sugarloaf Range
ROB06	Mt Robert
TUM06	Snowy Mountains
WAL06	Walcha
WEN06	Tolarno

CHANNEL 7	
BAL07	Buckombill Hill
BOM07	Bombala
BOO07	Booral - near Bulahdelah
COW07	Cowra
GLH07	Glen Lyon
GLI07	Glen Innes
MIL07	Milton
NUN07	Nundle - near Tamworth
SYD07	Sydney
WAL07	East of Walcha

CHANNEL 8	
BAT08	Bathurst
COB08	Cobar
CON08	Condobolin
EUC08	near Eucumbene
GLE08	Glen Innes

The following channels are the input channels for a repeater:

IN	Frequency (MHz)
31	477.175
32	477.200
33	477.225
34	477.250
35	477.275 ** for emergency use only
36	477.300
37	477.325
38	477.350

The output channels are listed below:

OUT	Frequency (MHz)
1	476.425
2	476.450
3	476.475
4	476.500
5	476.525 ** for emergency use only
6	476.550
7	476.575
8	476.600

Callsign Town/Locality

GRE08	Gresford - near Dungog
GRF08	near Grafton
KEM08	Kempsey
MER08	near Merimbula
MUR08	Tomewin
NAR08	Narrandera
ROB08	Illawarra
TBC08	Tooleybuc
URA08	Uralla - near Armidale
WAL08	Walcha
WOY08	Kariong

NORTHERN TERRITORY

Callsign Town/Locality

CHANNEL 1	
ALS01	85 km SE of Alice Springs
BPK01	90 km N of Alice Springs
DRW01	Darwin
KVB01	Double Hill
MLG01	Milingimbi

CHANNEL 2	
ALC02	115 km NE of Alice Springs
DDB02	Garibaldi Station
SWN02	150 km NNE of Alice Springs

CHANNEL 3	
ELK03	325 KM NE of Alice Springs
ERL03	185 KM SSW of Alice Springs
MMI03	Mistake Creek Station

CHANNEL 4	
DPW04	70 KM S of Alice Springs
MST04	110 KM S of Alice Springs

CHANNEL 5	
None assigned	
HEN06	120 KM SW of Alice Springs

CHANNEL 6	
AMB07	85 KM SE of Alice Springs
CHANNEL 7	
ASP07	Alice Springs

CHANNEL 8 None assigned

QUEENSLAND

Callsign Town/Locality

CHANNEL 1	
ANN01	St Annes Range
BAR01	near Barcaldine
BAT01	Bathurst Heads
BNE01	Mt Cotton
DEL01	Collinsville
HAN01	Hannaford
HUG01	Hughenden
ING01	Inglewood
INN01	Innisfail
MDT01	Middlemount
MOR01	Mt Hope
OWN01	Mt Oweenee
RKY01	Mt Archer
ROM01	Mt Bassett
SPC01	Windorah
TSV01	Townsville
TTH01	Twin Hills
WBB01	Mt Perry
WCT01	Charters Towers

CHANNEL 2	
GLD02	Gladstone
GLN02	Glenden
ING02	Mt Cordelia
JCK02	Julia Creek
LAU02	Laura
MAB02	Broadsound Range
MIN02	Glenlyon Dam
POR02	Drummond Range
SPC02	Bowen
TAM02	Tambo
TAR02	Taroom
TRN02	Quilpie
TWB02	Mt Kynoch
WAG02	Aranyi South
WAV02	Wavell Heights
WBR02	Mt Kanigan
WON02	Cogango Range

CHANNEL 3	
ABC03	Gold Coast
CHI03	Chinchilla
CTS03	Charters Towers
INK03	Mt Inkerman
KIL03	Kilcoy
LAI03	Mt Beau Brummell
MBO03	Tinana
MTI03	Monto
MTW03	Mt William
PCC03	Edward River
SPR03	Springure
VHO3	Mt Isa

CHANNEL 4	
BBG04	Sloping Hummock
DIP04	Double Island Point
EID04	Eidsvold
GDI04	Goondiwindi
HOP04	Rockhampton
IPS04	Ipswich
JER04	Jericho
MBH04	Moranbah
MOW04	Darling Downs
TSV04	Townsville
VHN4	Expedition Range
VHW4	Cannonvale

CHANNEL 5 *EMERGENCY REPEATERS*	
ABC05	Springbrook
BNE05	Mt Glorious
CEM05	Clermont
FSB05	Mt Goonaneman
GEM05	Mt Wolvi
ING05	Mt Cordelia
MIL05	Commodore Peak
QBM05	Darling Downs

VHN05 Charters Towers VHP05 Biloela

BLK06 Blackdown
Tablelands
BRA06 Sea View Range
CBT06 Mundubbera
CHT06 Mt Janet
CLE06 Police Mtn
CNE06 Bergen
DIM06 Mt North Iron
GLD06 Mt Larcom
MIL06 Palardo Hill
MKY06 Gympie / Mackay
PRR06 Clermont
RIC06 Yan Yean
TAM06 Tambo
THG06 Thargomindah
VHN06 Wilkes Knob

CHANNEL 7
BIL07 Banana Range
BNE07 Toohey Mtn
CTR07 Towers Hill
DMD07 Clermont
ESK07 Esk
GEM07 Gympie
IND07 Fraser Island
ING07 Mt Mercer
MUR07 Mt England
VHO7 Mt Hutton
WBB07 Mt Watalgan
WRA07 Warwick
YKA07 Mt Slowcombe

CHANNEL 8
AMI08 Amiens
BAL08 Noondoo
BLL08 Blackall
CHN08 Mt Peanga
CHT08 Charters Towers
DAW08 Comminglah
EMD08 Emerald
HBY08 Ghost Hill
MBR08 Mt Brisbane
NEB08 Nebo
ONV08 Ocean View
TLD08 Atherton
VHN08 Barkly Down

SOUTH AUSTRALIA

Callsign Town/Locality

CHANNEL 1
CDA01 Ceduna
MJN01 Oodnadatta
MTR01 Leigh Creek
PRC01 Carrieton (Nth of
Orroroo)
PAR01 Adelaide (North)
TYN01 Oodnadatta
VLA3 Crystal Brook

CHANNEL 2
BOR02 Bordertown
BRP02 Orroroo
CLV02 Cleve
MYP02 Myponga
VLA4 Kingoonya

CHANNEL 3
ADL03 Adelaide (Central)
ALN03 Yunta
BLN03 Blinman, Flinders
Ranges
CTR03 Moonta
KBY03 Port Elliot
UNO03 Port Augusta

CHANNEL 4
BLF04 Port Pirie
BAR04 Nuriootpa
KOK04 Lake Gairdner West
NAR04 Lucindale
PKI04 Kangaroo Island
(East of)

CHANNEL 5
EMERGENCY REPEATERS

ADL05 Adelaide suburb BEE05 Crystal Brook EUD05 Eudunda MNT05 west of Woomera MTG05 Penola/Mt Gambier

CHANNEL 6
LST06 Elliston (Eyre
Peninsula)
NON06 120 Km West of
PtAugusta
REN06 Renmark
SNO06 Snowtown
(nearPt Pirie)
TIN06 Coonalpyn
WKI06 Kangaroo Island
WLG06 Tarcoola
WLP06 Willpena

CHANNEL 7
CLR07 Clare
MTG07 MtGambier
MUT07 south of Cockburn
UNO07 Kyancutta
VLA7 Streaky Bay
WIL07 Hawker
YKP07 Warooka

CHANNEL 8
BRY08 Burra
MBV08 Murray Bridge
MTA08 Quorn
PTL08 Tumby Bay/Port
Lincoln
Oodnadatta (200 KM
SW)
Yalata (187 Km N/W
of Ceduna)

TASMANIA

Callsign Town/Locality

CHANNEL 1
DEV01 Devonport
FIS01 Flinders Island
SET01 Grasstree Hill

CHANNEL 2
CHN02 Herring Back
LCN02 Launceston
TWC02 Mt Read

CHANNEL 3
NEC03 Ben Lomond

CHANNEL 4
MID04 Millers Bluff

CHANNEL 5
EMERGENCY REPEATERS
HBT05 Hobart
LTE05 Fingerpost Hill

CHANNEL 6
REC06 Mt Paul
VJA6 Mt Lloyd
WCT06 St Valentines Peak

CHANNEL 7
CHT07 Barren Tier
TNE07 Mt Victoria

CHANNEL 8
BRN08 Burnie
TBL08 Table Mountain
TNE08 St Marys

VICTORIA

Callsign Town/Locality

CHANNEL 1
ALX01 Eildon
APS01 Apsley
MEL01 Melbourne
OME01 near Omeo
ROU01 Penshurst
STA01 St Arnaud
WAL01 Walhalla

BAL02 Ballarat KER02 Mt Kerang MAN02 Mansfield MOE02 Moe PYA02 Pyalong

CHANNEL 3
ABE03 South
DEL03 Bombala
HOR03 Horsham
FAL03 Falls Creek
JNR03 near Dartmoor
WBT03 Mt Wombat
WPH03 Weeaprainah
YLA03 Yelta

CHANNEL 4
ANA04 Mt Anakie
ARA04 Ararat
BEN04 Bendigo
CRJ04 Traralgon
HAW04 Hawkesdale
MCA04 Marambingo Hill

CHANNEL 5
EMERGENCY REPEATERS
BAL05 near Ballarat
MAN05 Mansfield
MEL05 Melbourne
RFY05 Ruffy

CHANNEL 6
FOS06 Mt Fatigue
HLV06 Healesville
ECH06 Echuca
BRN06 Mt Concorde
MSS06 Mt Seldom Seen
SWH06 Swan Hill
WAN06 Wangandry
WIL06 Mt William

CHANNEL 7
BOL07 Mt Bolton
BND07 near Bendigo
MEL07 Melbourne
MOR07 Mt Shadwell
MVL07 Mt Gordon
SHP07 Shepparton
TAL07 Mt Granya

CHANNEL 8
ART08 Safety Beach
DUN08 Cavendish
HAR08 Mt Alexander
MCN08 Mt Cann
MYR08 Mt Porepunkah
TER08 Mt Terrible

WESTERN AUSTRALIA

Callsign Town/Locality

CHANNEL 1
COL01 Collie
DEN01 Denmark
GER01 Geraldton
KAM01 Kambalda
KAT01 Katanning
KLB01 Kellerberrin
LEN01 Leonora
MIA01 Mia Mia Station

MKT01 Poison Hills PER01 Perth WAR01 Warakuma WIK01 Wickham

CHANNEL 2
BIN02 Bindoon
BUN02 Near Bunbury
CAR02 Carnamah
KAL02 Mt Charlotte
LYN02 Lyndon Station
MRD02 Merredin
VLN5 Mt McLure
WLP02 Walpole

CHANNEL 3
ALB03 Albany
CLA03 near Carlotta
NOR03 Nannup
PER03 Roleystone
VET03 near Bardoc

CHANNEL 4
BYB04 Dinninup
ESP04 Esperance
GNG04 Lancelin
KUL04 Kulin
MTB04 Cranbrook
NEW04 Newman

CHANNEL 5
EMERGENCY REPEATERS
PER05 Orange Grove
MTR05 Mt Barker
VLN6 Perth

CHANNEL 6
DAR06 Darkan
JUR06 Mt Lesueur
MGR06 near Margaret River
MNP06 Albany
MTS06 Mt Solus
VKM06 Wyalkatchem

CHANNEL 7
BDG07 Bridgetown
C0007 Coolgardie
MGR07 Augusta
MTB07 Stirling Ranges
PIN07 Pinjarra East
VRK07 Mt Bakewell

CHANNEL 8
MAN08 West Manjimup
MSA08 Mt Saddleback
PER08 Kalamunda
QUN08 Quinorlup
RVT08 Ravensthorpe

A.C.T.

Callsign Town/Locality

CHANNEL 1
CBA01 Canberra (Portable)
CHANNEL 2
CBA02 Isaacs Ridge
CHANNEL 7
GIN07 Mt Ginini
CHANNEL 8
CBA08 Isaacs Rid

REPEATER UPDATE

To maintain the UHF repeater list in an up-to-date manner requires the co-operation of repeater owners and local users. Please ensure that when an error is found, or an update is required, that you contact:

Trevor Colwell, ACBRO Inc.,

PO Box 170,

Walkerville 5081, South Australia

who will ensure that this information is included in the next repeater list.

Next month: two metre amateur repeaters

The Scout

The remarkable new Scout automatically finds frequencies and records them and will tune a receiver. Record a series of frequencies and then load them to a scanner for review.



- 10MHz-2.8GHz frequency range
- Six hour battery life
- Works 10-120 metres from transmitter
- Use as frequency counter tool
- Exclusive Optoelectronics digital filter and capture technology.
- 50 memories for discrete frequencies.
- 250 hit counter for each memory
- Reaction tunes some receivers.
- Interfaces to PC for datalogging.

25 Frequency Scout **\$820**

HandiCounter 3000A

The world's most highly advanced hand-held counter. Covers to 3GHz with frequency and multi-function features. Period, Ratio and Time Interval, all in the palm of your hand.



- 10Hz-3GHz, 0.1Hz resolution
- Period, time interval, ratio, average
- 250MHz direct counting
- Dual 50Ω/1MΩ inputs.
- Exclusive Optoelectronics digital filter and capture technology.
- 10 digit LCD display
- 1x10⁻⁵/yr time base
- Optional TCXO available
- Interfaces to PC for datalogging.

3000A HandiCounter **\$719**

HandiCounter M1

The M1 counter has the same 10Hz-2.8GHz range as the 3000A but no universal counter functions. Digital filter and capture still available as well as digital communications port.



- 10Hz-3GHz, 0.1Hz resolution
- 250MHz direct counting
- 50Ω/1MΩ input.
- Exclusive Optoelectronics digital filter and capture technology.
- Sensitive inputs for ease of use.
- 10 digit LCD display with electroluminescent backlighting.
- Low power, 4 to 5 hours battery life
- Interfaces to PC for datalogging.

M1 HandiCounter **\$512**

Mini HandiCounter 3300

The smallest member to the family still offers 1MHz-2.8GHz performance, 10 digit LCD display and long battery life in a package almost too small to believe.



- 1MHz-2.8GHz, 0.1Hz resolution
- 250MHz direct counting
- 50Ω input.
- Sensitive inputs for ease of use.
- 10 digit LCD display.
- Low power, 4 to 5 hours battery life.
- Easily replaced battery pack.
- Maximised sensitivity for picking up transmitters at greatest distance.
- Very compact, true pocket size.

3300 MiniCounter **\$265**

Decode tone information

The DC440 decodes CTCSS, DTMF & DCS signals output from receiver. Can be computer interfaced for logging purposes.



DC440 Tone decoder **\$532**

Collecting data with a frequency counter



of optional interfaces and software!

Many Optoelectronics products, including the 25, 3000A, M1, SSM220A and 8040 can be connected to a PC for data collection and logging. When used in conjunction with the DC440 decoder tone frequencies can be recorded as well.

Please call for details

8040 Multi-Function bench/portable counter

A 10 digit electroluminescent backlit LCD display, 3GHz performance and all the features of a universal counter make the 8040 a winner for general purpose bench, laboratory or field use.

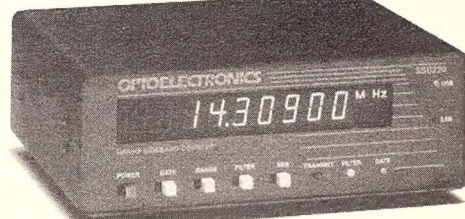


This counter is 'big brother' to the 3000A and has additional signal conditioning and options for higher stability time bases. Both 50Ω and 1MΩ inputs are provided for both inputs and each has a separate trigger level control.

8040 Multifunction bench/portable counter **\$1340**

SSB220A SSB counter

The truly unique SSB220A can measure the actual output frequency of an SSB transmitter! Also useful for general purpose applications to 3GHz.



By feeding a known audio signal to the transmitter you can easily determine which sideband and what frequency is being transmitted. The SSB220A uses the latest direct digital synthesis and digital signal processing technologies.

SSB220A 3GHz SSB counter **\$825**

Communications Interceptors

Optoelectronics presents a totally new instrumentation concept, the Model R10 FM Communications Interceptor. Developed for two-way communications testing, it has significant impact in security, counter-surveillance and recreational communications monitoring applications.

The Interceptor™ measures deviation (wide and narrow band), relative signal strength, signaling tones (CTCSS, DCS, and DTMF) using the companion DC440 Decoder. The R10 can be used for any measurement requiring demodulated FM. The R10 is ideal for testing VHF, UHF and Cellular transmitters and can be a low cost, highly portable substitute for a service monitor in some applications.

New Technology

The Interceptor™ responds to any strong signal present, unlike a conventional radio receiver or scanner. Conventional receivers are stabilised and tuned to a particular frequency by an internal oscillator. The Interceptor is stabilised by the signal it is receiving. The advantage of this process is that the Interceptor™ does not have to be tuned to a frequency in order to receive a signal. Any FM signal from 30MHz to over 2GHz can be intercepted without gaps in coverage. The Interceptor™ is completely automatic for hands free operation.

Security & Counter Surveillance Uses

This great sensitivity to Near Field signals makes the Interceptor™ ideal for RF security and

counter surveillance applications. The signal strength bargraph is useful in locating stuck transmitters or listening devices concealed in a room or automobile.

Communications Monitoring

In the Near Field — Unlike the scanners and receivers that must be tuned to a specific frequency or scanned through a fixed frequency range, the Interceptor™ will provide an exciting new dimension to recreational monitoring with near instant response to strong signals. Communications monitoring hobbyists will be able to take the Interceptor™ on cruise ships, to military bases, theme and amusement parks, zoos, airports, to space shuttle launches, parades, sporting events, car races and anywhere else two way FM communication is used.



R10 Interceptor **\$679**

The Optoelectronics R-20 AM near field interceptor is useful for detecting AM signals and measuring the strength of signals from 5-2500MHz. Also useful for amateur, CB or AM broadcast testing as well as for locating hidden transmitters (bugs) & checking microwave oven leakage.



R20 **\$225**

DAYCOM Communications Pty. Ltd.
37A Fenton Street, Huntingdale 3166

Bankcard, MasterCard
& Visa all welcome

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MFJ941E	300W compact GP tuner	\$247
MFJ945D	300W mobile tuner	\$198
MFJ948	Deluxe 300W (no D/L)	\$292
MFJ949E	Deluxe 300W	\$337
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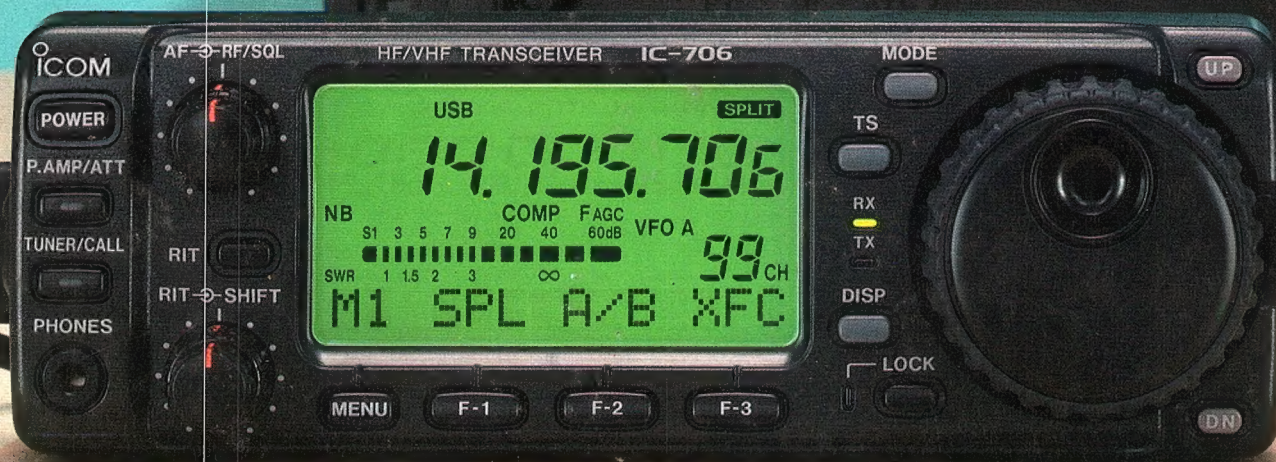
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